

LOCKHEED MARTIN

Date: May 18, 2000

To: Alan Humphrey, U.S. EPA/ERTC Work Assignment Manager

From: Donald T. Bussey, REAC Task Leader *(dell tb)*

Re: Technical Memorandum, Jard Company, Inc. Groundwater Investigation, Bennington, Vermont

At the request of the United States Environmental Protection Agency (U.S. EPA) Environmental Response Team Center (ERTC) Work Assignment Manager (WAM), Alan Humphrey, the Response Engineering and Analytical Contract (REAC) conducted a limited site groundwater investigation at the Jard Company, Inc. (Jard) site in Bennington, Vermont. The investigation, completed between Monday, January 17, 2000 and Friday, February 4, 2000, included the installation of ten groundwater monitoring wells, and the surveying, gauging, and groundwater sampling of the newly installed ten wells (EPA-1 through EPA-10) in addition to four pre-existing site wells (MW-1, MW-2, MW-4, and MW-6). The purpose of these efforts was to determine the site's groundwater flow direction, to assess whether free-phase fluids were present floating on the site's groundwater, and to evaluate the site's groundwater chemistry for the presence of polychlorinated byphenols (PCBs), and volatile and semi-volatile organic compounds (VOCs and semi-VOCs).

Monitor Well Installation

Ten groundwater monitor wells (EPA-1 through EPA-10) were installed on-site between Monday, January 17, 2000 and Wednesday, February 2, 2000. The locations of these ten newly installed monitor wells are illustrated on Figure 1 (attached). Monitor well EPA-1 was installed using conventional hollow stem auger drilling practices. Due to the hard drilling encountered as a result of the presence of subsurface cobble and boulder deposits, monitor wells EPA-2 through EPA-10 were installed via air drilling methods, advancing temporary steel casing with the drill bit as these boreholes were advanced. No subsurface sampling was performed, also as a result of subsurface conditions.

Monitor wells EPA-1 through EPA-10 were constructed of 2-inch inner diameter (ID) Schedule 40 PVC. The base of EPA-1 included a five foot long, 0.020-inch slotted (20-slot), PVC screen, and the base of EPA-2 through EPA-10 included ten foot long 20-slot PVC screens. Well screens were attached to an appropriate length of riser casing which extended approximately two feet above grade. A compatible sandpack for 20-slot screens was installed between the borehole wall and the well screens to approximately one to two feet above the top of the well screens, with a one to two foot bentonite seal installed above the sandpack. The remainder of the annular space between the borehole and the PVC was cemented to the surface with a Portland cement/bentonite grout. A protective steel casing was emplaced over the PVC riser casing into the grout and secured with keyed-alike padlocks (Master Lock number 2863 - additionally, the four existing monitor wells and the site's gate were secured with the same keyed-alike lock). Subsequent to well completions EPA-1 through EPA-10 were developed to clear the wells of fine grained sediment and to insure the wells were transmitting groundwater.

Well Survey

On Friday, February 4, 2000 the ten newly installed monitor wells (EPA-1 through EPA-10), and the four pre-existing wells (MW-1, MW-2, MW-4, and MW-6) were vertically surveyed by a local licensed land surveyor. Horizontal control was established on-site by REAC using global positioning system (GPS) equipment. The vertical survey included the relative elevation of the ground surface at the well locations, and the top of the PVC casings of each of the 14 wells. These data are summarized in Table 1 (attached). The site benchmark is the top of the southeast quarter of the cement above ground tank saddle situated adjacent to EPA-1. This reference was assumed to be at an elevation of 100 feet, and all elevation measurements presented on Table 1 and Figure 2 (attached) are referenced to this vertical position.

Groundwater/Free-Phase Fluid Depth Gauging

Depth to groundwater gauging was conducted on February 4, 2000 for all 14 on-site monitor wells. These data have been reduced using survey data to calculate groundwater elevation data and are presented in Table 1 and illustrated on Figure 2 (attached). Additionally, the presence of free-phase fluids was gaged in each well employing an oil/water interface probe. No free-phase fluid was detected by this equipment in any of the 14 on-site wells gaged.

Groundwater Sampling and Analysis

The 14 Jard monitor wells were sampled between Wednesday and Thursday, February 2-3, 2000. The wells were evacuated and sampled utilizing standard U.S. EPA procedures. Groundwater samples collected from these wells were analyzed for PCBs, VOCs, and semi-VOCs.

With the exception of EPA-1 no other groundwater monitor well was observed to have free-phase fluids floating on the groundwater surface when the wells were evacuated. Although no detectable, measurable free-phase fluid was detected with an oil/water interface probe (discussed above), a very small layer of a fluid which was observed to be different than water was noted during the evacuation of EPA-1. As such, this initial fluid with some groundwater was collected and analyzed as a separate, additional sample, for PCBs in addition to the routine groundwater sampled collected from EPA-1.

Summary

Groundwater Flow Direction

Groundwater elevation data (depth to groundwater data reduced with vertical survey data) for the 14 Jard monitor wells have been posted and contoured and are illustrated on Figure 2 (attached). The site's groundwater flow direction is from the southeast towards the northwest, approximately parallel with the flow direction of the Roaring Branch of the Walloomsac River.

Free-Phase Fluid Assessment

As noted above, with the exception of an observed, immeasurable layer of free-phase fluid noted during the evacuation of EPA-1, the remaining 13 on-site Jard monitor wells were not

found to contain a free-phase floating layer on the groundwater surface. Table 1 (attached) presents reduced groundwater elevation data in addition to the screened elevations of each monitor well. Review of these data indicate that the groundwater surface at each well does intersect the well's screened interval, and therefore if a floating free-phase layer was present at a given well location, the fluid would be within the well.

Groundwater Chemistry

VOCs were detected in two of the 14 on-site Jard monitor wells (detectable concentrations of acetone were detected in all samples, at very low levels, and are interpreted to be laboratory-introduced). EPA-1 contained the highest amount of total VOCs at 259.6 parts per billion (ppb), including Vinyl Chloride (12 ppb), Chloroethane (8.1 ppb), 1,1-Dichloroethane (38 ppb), 2-Butanone (2.8 J ppb), cis-1,2-Dichloroethene (7.5 ppb), 1,1,1-Trichloroethane (2 ppb), Benzene (63 ppb), Toluene (14 ppb), Chlorobenzene (3.5 ppb), Ethylbenzene (1.5 ppb), p&m-Xylene (3.4 ppb), o-Xylene (2.6 ppb), Isopropylbenzene (3.2 ppb), 1,3,5-Trimethylbenzene (1.9 ppb), 1,3-Dichlorobenzene (8.9 ppb), 1,4-Dichlorobenzene (82 ppb), 1,2-Dichlorobenzene (3.9 ppb), and 1,2,4-Trichlorobenzene (1.3 ppb). The only other Jard monitor well with detectable concentrations of VOCs was MW-6 at a total VOC concentration of 18.4 ppb (with 2.8 ppb Chloroethane, 4.4 ppb 1,1-Dichloroethane, 1.3 ppb cis-1,2-Dichloroethene, 1.3 ppb 1,3-Dichlorobenzene, and 8.6 ppb 1,4-Dichlorobenzene). These data are presented on Figure 3 and in the Analytical Report (attached).

Semi-VOCs were detected in six of the 14 Jard monitor wells (EPA-1, MW-6, EPA-2, EPA-5, EPA-9, and EPA-10). Monitor well EPA-1 contained by far the majority of the semi-VOCs, including 400 parts per million (ppm) bis (2-Ethylhexyl) phthalate, 27 J ppb 1,3-Dichlorobenzene, 240 ppb 1,4-Dichlorobenzene, 12 J ppb 1,2-Dichlorobenzene, 14 J ppb 4-Methylphenol, 17 J ppb 1,2,4-Trichlorobenzene, 280 ppb Fluorene, and 24 J ppb Di-n-octylphthalate. MW-6 contained 140 ppb bis (2-Ethylhexyl) phthalate, 4.6 J ppb 1,4-Dichlorobenzene, and 2.1 J ppb Fluorene. EPA 2, EPA-5, EPA-9, and EPA-10 contained bis (2-Ethylhexyl) phthalate at the respective concentrations of 3.2 J ppb, 2 J ppb, 2.9 J ppb, and 6.3 J ppb. These data are included in the attached Analytical Report.

PCBs, specifically what was interpreted to be Aroclor 1242, were detected in seven on-site Jard monitor wells. Monitor well EPA-1 had by far the highest detectable concentration at 5.2 ppm (the purged groundwater sample - the sample containing the free-phase fluid contained a detectable concentration of 21 ppm). The other six monitor wells containing Aroclor 1242 were MW-6 (19 ppb), EPA-2 (4.5 ppb), EPA-4 (8.5 ppb), EPA-9 (5 ppb), EPA-10 (7 ppb), and MW-1 (2.4 ppb). These data are presented on Figure 4 and in the Analytical Report (attached).

Interpretation

Based upon analytical results of groundwater samples collected from the 14 on-site Jard wells, the horizontal location of elevated groundwater chemistry (VOCs, semi-VOCs, and PCBs) at the Jard Company site is at EPA-1. Detectable concentrations of compounds at EPA-1 were orders of magnitude greater than those detected anywhere else on-site. The only other on-site monitor well found to contain VOCs, semi-VOC, and PCBs was MW-6, located directly hydraulically downgradient of EPA-1. Every compound detected at MW-6 was detected at EPA-1 at much greater concentrations, indicating dilution or dispersion of approximately at least an order of magnitude over a distance of

approximately 260 feet. Aside from the EPA-1 to MW-6 lineation, site-wide Aroclor 1242 and bis (2-Ethylhexyl) phthalate were detected at low levels (Aroclor 1242 from 2.4 ppb to 8.5 ppb, and bis (2-Ethylhexyl) phthalate from 2 J ppb to 6.3 J ppb) at a few cross-gradient locations, and no site-derived contamination appears to be entering the Roaring Branch of the Walloomsac River.

- Attachments:
- Table 1 - Vertical Survey, Monitor Well Screened Interval, and Groundwater Elevation Data
 - Figure 1 - Site Map
 - Figure 2 - Groundwater Elevation Contour Map (February 4, 2000)
 - Figure 3 - Total VOC Concentrations (ppb) (February 2-3, 2000)
 - Figure 4 - Total PCB Concentrations (ppb) (February 2-3, 2000)
 - Analytical Report, Jard Co. Site, Bennington, Vermont

TABLE 1
VERTICAL SURVEY, MONITOR WELL SCREENED INTERVAL, AND GROUNDWATER ELEVATION DATA

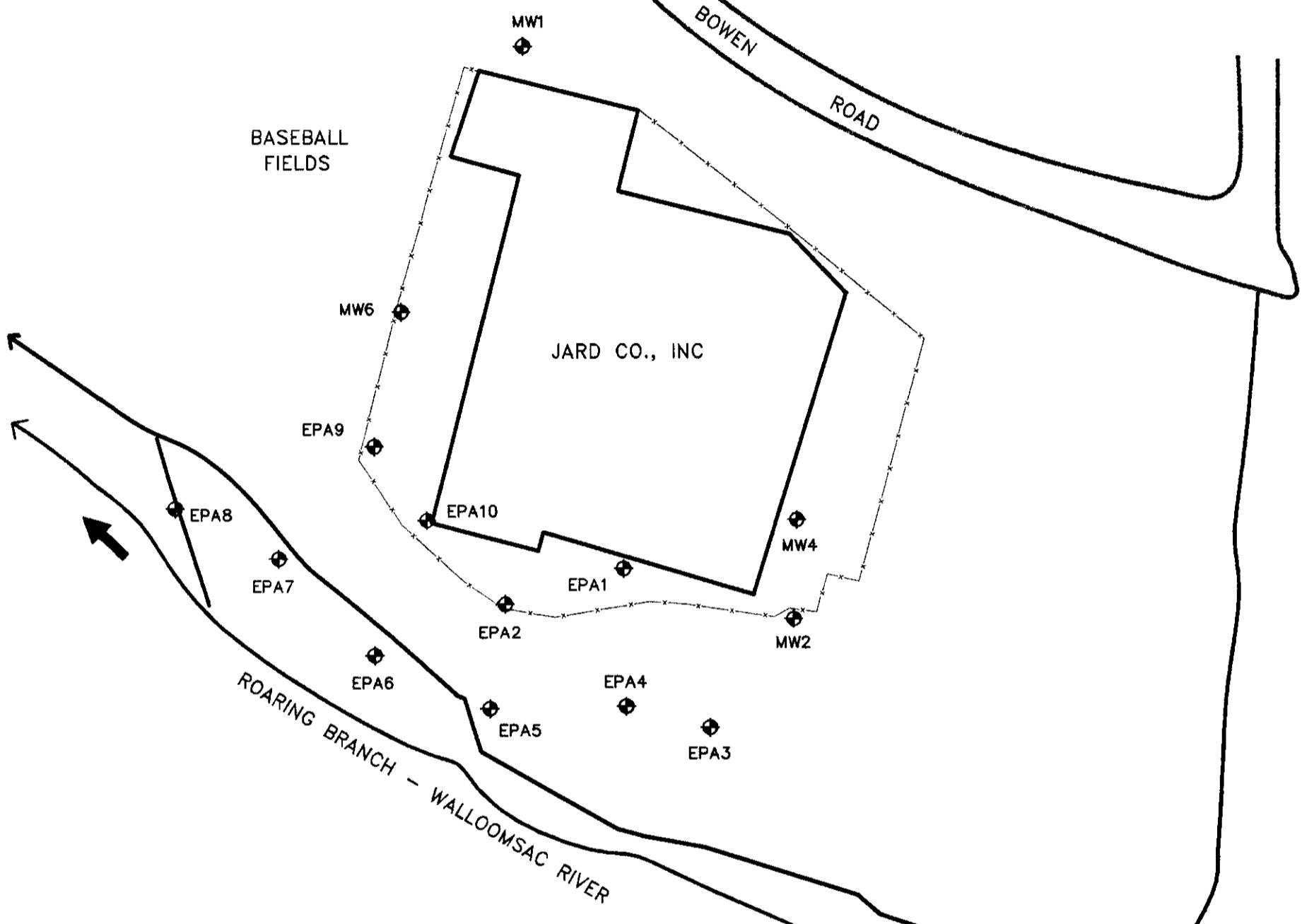
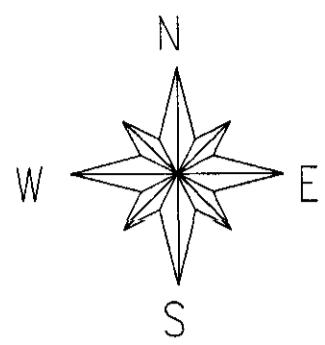
**JARD COMPANY SITE
 BENNINGTON, VERMONT**

<u>Monitor Well Identification</u>		<u>Elevation Ground Level (Feet AD)</u>	<u>Elevation Top PVC (Feet AD)</u>	<u>Depth to Groundwater From Top of PVC 4-Feb-2000 (Feet)</u>	<u>Groundwater Elevation (Feet AD) 4-Feb-2000</u>	<u>Well Screened Interval Elevation (Feet AD)</u>
MW-1	#	92.3	94.43	10.08	84.35	81.0 - 86.0
MW-2	#	96.4	98.88	7.44	91.44	89.4 - 94.4
MW-4	#	95.9	98.28	7.68	90.60	88.4 - 93.4
MW-6	#	94.5	96.93	12.11	84.82	82.7 - 87.7
EPA-1	@	97.7	100.09	9.11	90.98	87.7 - 92.7
EPA-2		96.3	98.87	8.99	89.88	82.8 - 92.8
EPA-3		98.1	100.74	8.97	91.77	85.1 - 95.1
EPA-4		98.0	100.32	9.18	91.14	84.5 - 94.5
EPA-5		112.6	114.93	24.50	90.43	86.6 - 96.6
EPA-6		109.1	111.11	22.65	88.46	84.1 - 94.1
EPA-7		116.9	119.18	33.01	86.17	81.9 - 91.9
EPA-8		101.2	103.72	19.52	84.20	78.7 - 88.7
EPA-9		95.6	98.14	11.60	86.54	80.1 - 90.1
EPA-10		95.9	98.54	10.93	87.61	80.4 - 90.4

Notes: # - Screened interval data for MW-1, MW-2, MW-4, and MW-6 from Wehran Report 2/91.

@ - Monitor well EPA-1 replaces damaged monitor well MW-3.

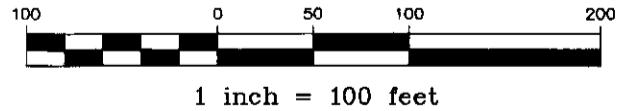
AD - Assumed On-Site Datum (100.00 feet top of southeast corner of AST saddle adjacent to EPA-1).



LEGEND

- MONITOR WELL LOCATION
- RIVER EDGE
- PATH (ON BERM ALONG RIVER)
- BOWEN ROAD
- x-x-x- FENCE
- [] BUILDING
- RIVER FLOW DIRECTION

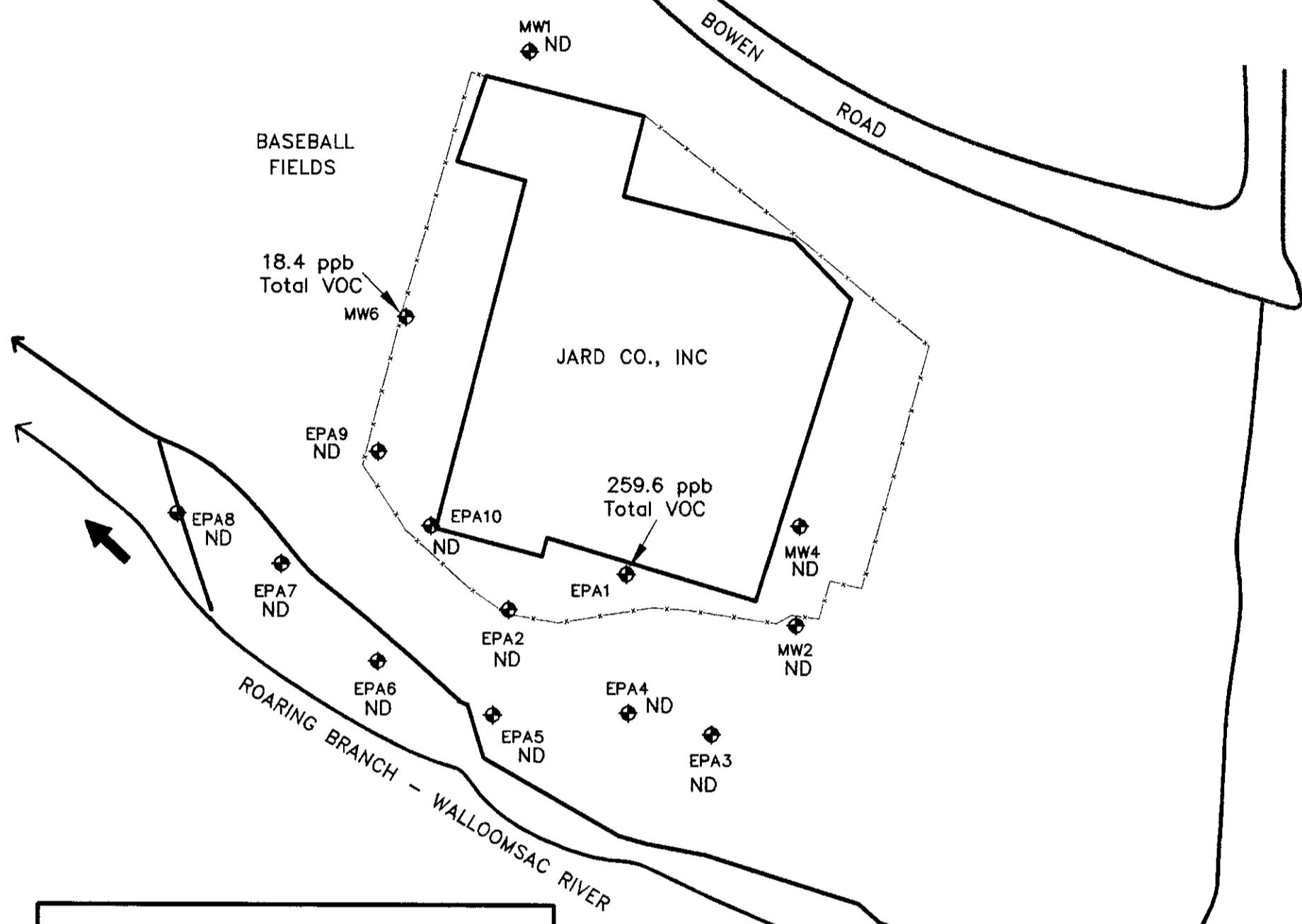
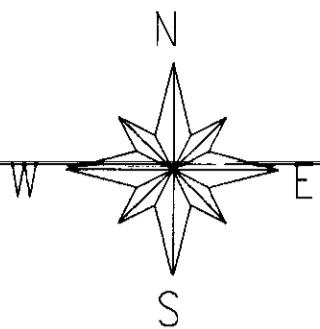
GRAPHIC SCALE



**FIGURE 1
SITE MAP
JARD CO. SITE
BENNINGTON, VERMONT
APRIL 2000**

U.S. EPA ENVIRONMENTAL RESPONSE TEAM CENTER
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-C99-223
V.D.# RIA00107

107/SITE_MAP.DWG 4/20/00



LEGEND

- ◆ MONITOR WELL LOCATION
- 18.4 ppb VOC CONCENTRATION
- ND NOT DETECTED
- RIVER EDGE
- PATH (ON BERM ALONG RIVER)
- BOWEN ROAD
- FENCE
- BUILDING
- RIVER FLOW DIRECTION

GRAPHIC SCALE

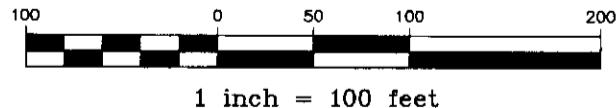
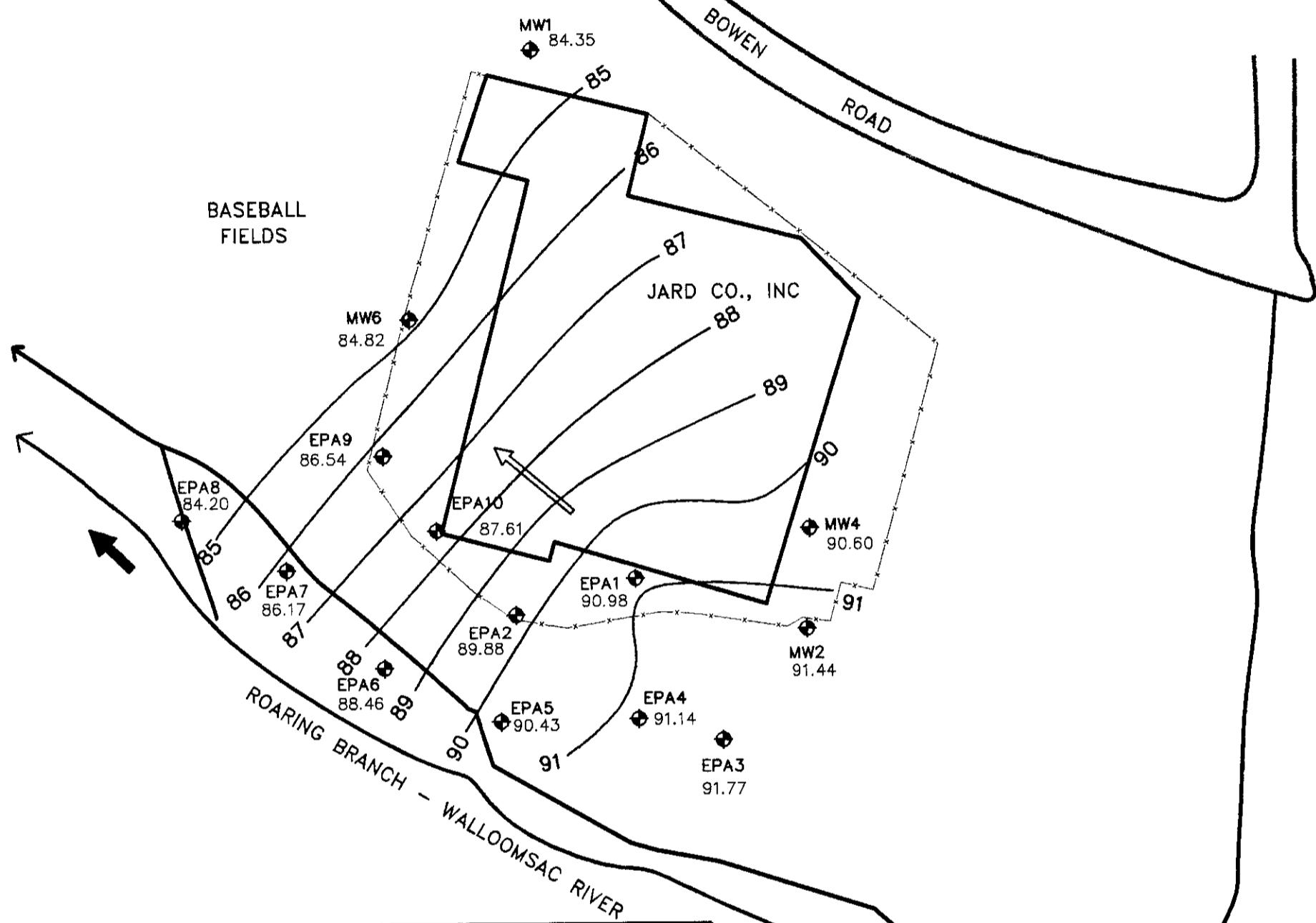
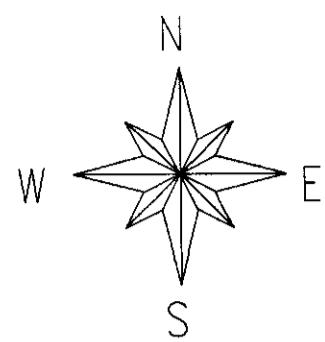


FIGURE 3
TOTAL VOC CONCENTRATIONS (ppb)
02/02-03/00
JARD CO. SITE
BENNINGTON, VERMONT
APRIL 2000

U.S. EPA ENVIRONMENTAL RESPONSE TEAM CENTER
 RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
 68-C99-223
 V.D.# RIA00107

107/SITE_MAP.DWG 4/2000



LEGEND

- 84.82 MONITOR WELL LOCATION GROUNDWATER ELEVATION (feet)
- 85 GROUNDWATER ELEVATION CONTOUR (feet)
- GROUNDWATER FLOW DIRECTION
- RIVER EDGE
- PATH (ON BERM ALONG RIVER)
- BOWEN ROAD
- FENCE
- BUILDING
- RIVER FLOW DIRECTION

GRAPHIC SCALE

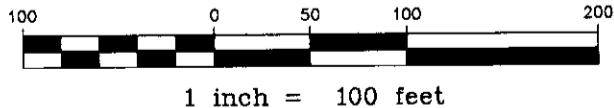
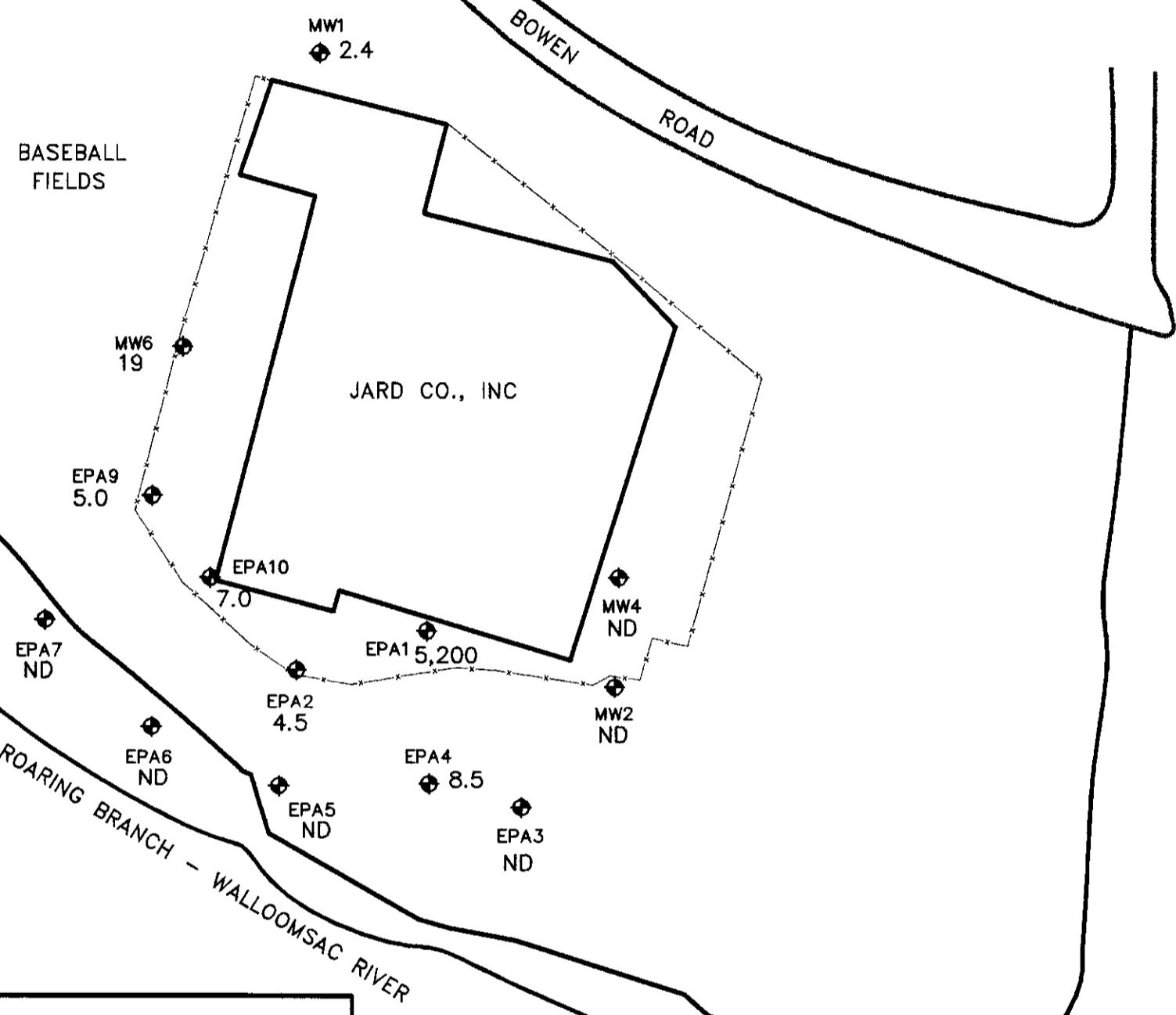
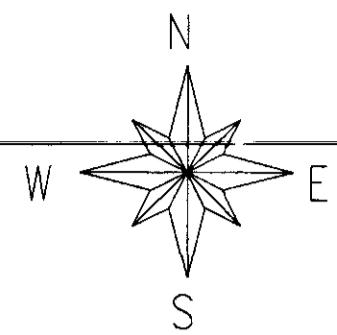


FIGURE 2
GROUNDWATER ELEVATION
CONTOUR MAP (02/04/00)
JARD CO. SITE
BENNINGTON, VERMONT
APRIL 2000

U.S. EPA ENVIRONMENTAL RESPONSE TEAM CENTER
RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
68-C99-223
W.D.# RIAD0107

107/CONT_MAP.DWG 4/20/00



GRAPHIC SCALE

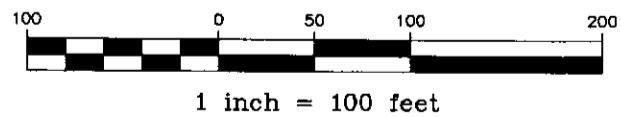


FIGURE 4
TOTAL PCB CONCENTRATIONS (ppb)
(02/02-03/00)
JARD CO. SITE
BENNINGTON, VERMONT
APRIL 2000

U.S. EPA ENVIRONMENTAL RESPONSE TEAM CENTER
 RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
 68-C99-223
 W.D.# RIA00107

107/SITE_MAP.DWG 4/20/00

ANALYTICAL REPORT

Prepared by
LOCKHEED MARTIN, Inc.

Jard Co. Site
Bennington, Vermont

March 2000

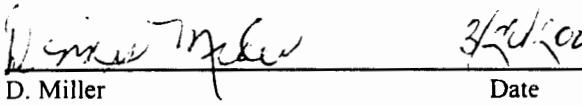
EPA Work Assignment No.0-107
LOCKHEED MARTIN Work Order: R1A00107
EPA Contract No. 68-C99-223

Submitted to
A. Humphrey
EPA-ERTC


D. Bussey
Task Leader

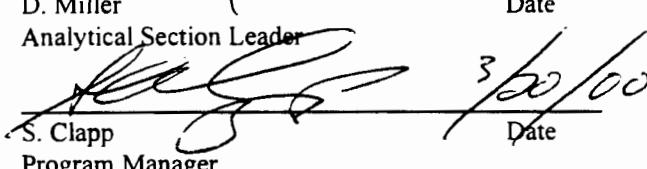
3/16/00
Date

Analysis by:
REAC


D. Miller
Analytical Section Leader

3/20/00
Date

Prepared by:
M. Bernick


S. Clapp
Program Manager

3/20/00
Date

Reviewed by:
D. Killeen

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Appendices will be furnished on request.

Introduction

REAC in response to WA# 0-107, provided analytical support for environmental samples collected from Jard Co. Site, located in Bennington, Vermont as described in the following table. The support also included QA/QC, data review, and preparation of an analytical report containing a summary of the analytical methods, the results, and the QA/QC results.

The samples were treated with procedures consistent with those specified in SOP #1008.

COC #	Number of Samples	Sampling Date	Date Received	Matrix	Analysis	Laboratory
03477	5	2/2/00	2/4/00	Water	VOC, BNA & PCB	REAC
03478	3					
03479	5					
03481	4				VOC	
	1				PCB	
03428	1		2/15/00			

Case Narrative

The data in this report have been validated to two significant figures. Any other representation of the data is the responsibility of the user.

VOC Package J046

Method blank 020900 file BV1061.D contained 1.4 µg/L hexachlorobutadiene. This compound was not detected in the associated samples; the data are not affected.

Sample A-D27628, the trip blank, contained 2.7 µg/L acetone. The acetone results for samples E-G27607 through E-G27611, E-G27614 through E-G27617, E-G27619, E-G27620, E-G27621, E-G27624 through E-G27627 are considered not detected because the concentration in the samples is less than ten times the concentration found in the method blank.

In the initial calibration on 2/3/00, file WIC0203A.M, the percent relative standard deviation (%RSD) exceeded the QC limits for 4-methyl-2-pentanone (33), 2-hexanone (30.3), 1,2-dibromo-3-chloropropane (31), 1,2,4-trichlorobenzene (34) and naphthalene (37). These compounds were not detected in the associated samples; the data are not affected.

In the initial calibration on 2/8/00, file WIC0208B.M, the percent relative standard deviation (%RSD) exceeded the QC limits for 2,2-dichloropropane (31), trans-1,3-dichloropropene (31), bromoform (33) and 1,2-dibromo-3-chloropropane (37). These compounds were not detected in the associated samples; the data are not affected.

In the continuing calibration of 2/4/00, file AV1403.D, the percent difference exceeded the QC limits for vinyl chloride (34%), 2-butanone (27%), 4-methyl-2-pentanone (28%), 2-hexanone (29%) and 1,2-dibromo-3-chloropropane (34%). These compounds were not detected in the associated samples; the data are not affected.

In the continuing calibration of 2/9/00, file BV1060.D, the percent difference exceeded the QC limits for acetone (42%), 2,2-dichloropropane (56%) and hexachlorobutadiene (47%). The 2,2-dichloropropane results for samples E-G27616 through E-G27621 and E-G27624 through E-G27626, the acetone results for samples E-G27616, E-G27617, E-G27619 through E-G27621 and E-G27624 through E-G27626 and the hexachlorobutadiene result for method blank 020900 are considered estimated.

The response factor (RF) exceeded the QC limits for 1,2-dibromo-3-chloropropane in the continuing calibration of 2/4/00, file AV1403.D, RF= 0.039 and in the continuing calibration of 2/9/00, file BV1060.D, RF =0.045. The 1,2-dibromo-3-chloropropane results for method blanks 020400-2 and 020900 and samples E-G27621, E-G27607 through E-G27611, E-G27614 through E-G27616, E-G27624 and A-D27628 are considered unusable.

BNA Package J047

One base-neutral and one acid surrogate were not recovered, exceeding the QC limits for sample C-D27620; the data are not affected.

Internal standard chrysene-d₁₂ area recovery (18%) exceeded the QC limits for sample C-D27620. The method detection limits (MDLs) for the compounds quantitated by this internal standard were elevated to 50000 µg/L based on the successful internal standard area recovery for the 5000 dilution analysis of the sample.

PCB Package J041

In the end of sequence calibration check on 2/7/00 the percent difference exceeded the QC limits for aroclor 1242 (105%); the data are not affected.

One surrogate percent recovery exceeded the QC limits for wblk020700. All the results for samples A-B27607 through A-B27611, A-B27614 through A-B27621 and A-B27624 through A-B27627 are considered estimated.

One surrogate percent recovery exceeded the QC limits for samples A-B27608, A-B27617, A-B27619, A-B27612MS and A-B27622MS; the data are not affected.

Two surrogate percent recoveries exceeded the QC limits for sample A-B27620; all results are considered estimated.

Aroclor 1242 sample results were quantitated utilizing peaks that were less than 25 percent of scale due to weathering. The analyst's selection of these peaks was based on professional judgement.

PCB Package J072

Sample A-C27629 was received by the laboratory 5 days outside the extraction holding time criteria and analyzed at the request of the Task Leader. The sample was analyzed 7 days outside the extraction holding time criteria; all results are considered estimated.

One surrogate percent recovery exceeded the QC limits for sample A-C27629; the data are not affected.

Aroclor 1242 sample results were quantitated utilizing peaks that were less than 25 percent of scale due to weathering. The analyst's selection of these peaks was based on professional judgement.

One hundred mL of sample A-C27629 instead of one liter of sample was extracted and analyzed for PCBs due to insufficient sample volume.

Summary of Abbreviations

AA	Atomic Absorption				
B	The analyte was found in the blank				
BFB	Bromofluorobenzene				
C	Centigrade				
cont.	Continued				
D	(Surrogate Table) this value is from a diluted sample and was not calculated (Result Table) this result was obtained from a diluted sample				
Dioxin	denotes Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans and/or PCDD and PCDF				
CLP	Contract Laboratory Protocol				
COC	Chain of Custody				
CONC	Concentration				
CRDL	Contract Required Detection Limit				
CRQL	Contract Required Quantitation Limit				
DFTPP	Decafluorotriphenylphosphine				
DL	Detection Limit				
E	The value is greater than the highest linear standard and is estimated				
EMPC	Estimated maximum possible concentration				
ICAP	Inductively Coupled Argon Plasma				
ISTD	Internal Standard				
J	The value is below the method detection limit and is estimated				
LCS	Laboratory Control Sample				
LCSD	Laboratory Control Sample Duplicate				
MDL	Method Detection Limit				
MI	Matrix Interference				
MS (BS)	Matrix Spike (Blank Spike)				
MSD (BSD)	Matrix Spike Duplicate (Blank Spike Duplicate)				
MW	Molecular Weight				
NA	either Not Applicable or Not Available				
NC	Not Calculated				
NR	Not Requested				
NS	Not Spiked				
% D	Percent Difference				
% REC	Percent Recovery				
PPB	Parts per billion				
PPBV	Parts per billion by volume				
PPMV	Parts per million by volume				
PQL	Practical Quantitation Limit				
QA/QC	Quality Assurance/Quality Control				
QL	Quantitation Limit				
RPD	Relative Percent Difference				
RSD	Relative Standard Deviation				
SIM	Selected Ion Monitoring				
TCLP	Toxic Characteristics Leaching Procedure				
U	Denotes not detected				
W	Weathered analyte; the results should be regarded as estimated				
m ³	cubic meter	kg	kilogram	μg	microgram
L	liter	g	gram	pg	picogram
mL	milliliter	mg	milligram	ng	nanogram
μL	microliter				
*	denotes a value that exceeds the acceptable QC limit				
	Abbreviations that are specific to a particular table are explained in footnotes on that table				

Revision 2/15/00

Analytical Procedure for VOC in Water

A modified 524.2 method was used for the analysis of Volatile Organic Compounds in water. Samples were purged, trapped, and desorbed to a GC/MS system. Prior to purging, the samples were spiked with a three component surrogate mixture consisting of toluene-d₈, 4-bromofluorobenzene and 1,2-dichloroethane-d₄ and a three component internal standard mixture consisting of bromochloromethane, 1,4-difluorobenzene, and chlorobenzene-d₅. The following conditions and parameters were utilized:

The purge and trap unit consisted of: A Tekmar concentrator (3000 series) equipped with an Archon autosampler (Dynatech) and a VOCARB 3000 trap (Supelco).

The purge and trap instrument conditions were:

Purge	10 min at 25° C
Dry Purge	2 min at 25° C
Desorb Preheat	230° C
Desorb	4 min at 230° C
Purge Flow Rate	40 mL/min
Bake	10 min at 260° C

A Hewlett Packard 5973 GC/MSD equipped with an HP Chem Station data system was used to analyze the data.

The instrument conditions were:

Column:	30 meter x 0.25mm ID, RTx-Volatiles (Restek Corp.) column with 3.0µm thickness.
Temperature:	4 min at 40° C 9° C/min to 165° C, hold for 2 min. 12° C/min to 220° C, hold for 7 min.
Flow Rate	Helium at 1.0 mL/min
Mass Spectrometer:	Electron Impact Ionization at a nominal electron energy of 70 electron volts, scanning from 35-300 amu at one scan/sec.

Computer: Preprogrammed to plot Extracted Ion Current Profile (EICP); capable of integrating ions and plotting abundances vs time or scan number. A library search (NBS-Wiley) for tentatively identified compounds was performed on samples.

The GC/MS system was calibrated using 6 VOC standards at 5, 20, 50, 100, 150, and 200 µg/L. (Except acetone which was calibrated using 5 VOC standards at 20, 50, 100, 150, and 200 µg/L.) Before analysis each day, the system was tuned with 50 ng BFB and passed a continuing calibration check when analyzing a 50 µg/L standard mixture in which the responses were evaluated by comparison to the average response of the calibration curve.

The results are in Table 1.1; the tentatively identified compounds (TIC) are listed in Table 1.2. The concentrations of the analytes were calculated using the following equation:

$$C_u = \frac{A_x \times I_{is} \times D}{A_{is} \times RF \text{ (or } RF_{ave})}$$

where

C_u	= Concentration of target analyte ($\mu\text{g/L}$)
A_x	= Area of the target analyte
I_{is}	= Concentration of specific internal standard ($\mu\text{g/L}$)
A_{is}	= Area of the specific internal standard
RF	= Response Factor
RF_{ave}	= Average Response Factor
D	= Dilution factor

The average Response Factor is used when a sample is associated with an initial calibration curve. The Response Factor is used when a sample is associated with a continuing calibration curve.

Response Factor calculation:

The response factor (RF) for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_c \times I_{is}}{A_{is} \times I_c}$$

where,

RF	= Response factor for a specific analyte
A_c	= Area of the analyte in the standard
I_{is}	= Concentration of the specific internal standard
A_{is}	= Area of the specific internal standard
I_c	= Concentration of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + \dots + RF_n}{n}$$

and

n = number of Samples

Revision of 5/4/99

Analytical Procedure for BNA in Water

Extraction Procedure

Prior to extraction, each sample was spiked with a six component surrogate mixture consisting of nitrobenzene-d₅, 2-fluorobiphenyl, terphenyl-d₁₄, phenol-d₅, 2-fluorophenol, and 2,4,6-tribromophenol. One liter of sample was extracted according to Method 625, Section 10, as outlined in the Federal Register Vol. 49, #209, Friday, Oct. 26, 1984. The extracts were combined, concentrated to 1.0 mL, an internal standards mixture consisting of 1,4-dichlorobenzene-d₄, naphthalene-d₈, acenaphthene-d₁₀, phenanthrene-d₁₀, chrysene-d₁₂, and perylene-d₁₂ was added, and analyzed.

Analytical Procedure

An HP 6890 GC and a HP 5972 MSD, equipped with a 6890 autosampler and controlled by a PC computer with Enviroquant software was used to analyze the samples.

The instrument conditions were:

Column	Restek Rtx-5 (crossbonded SE-54) 30 meter x 0.25mm ID, 0.50 µm film thickness
Injector Temperature	280° C
Transfer Temperature	280° C
Source and Analyzer Temperature	Controlled by thermal transfer of heat from transfer line
Temperature Program	50°C for 0.5 minutes 20° C/min to 295° C; hold for 8 minutes 25° C/min to 310° C; hold for 15 minutes
Pulsed Split Injection	8:1 split Ratio
Injection Volume	1 µL

The GC/MS system was calibrated using 5 BNA standards at 20, 50, 80, 120, and 160 µg/mL. Before analysis each day, the system was tuned with 50-ng decafluorotriphenylphosphine (DFTPP) and passed a continuing calibration check when analyzing a 50-µg/mL standard mixture in which the responses were evaluated by comparison to the average response of the calibration curve.

The BNA results are listed in Table 1.3; the tentatively identified compounds are listed in Table 1.4. The concentration of the detected compounds was calculated using the following equation:

$$C_u = \frac{DF \times A_u \times I_{is} \times V_i}{A_{is} \times RF (\text{or } RF_{ave}) \times V_i \times V_o}$$

where

C_u	= Concentration of target analyte ($\mu\text{g/L}$)
DF	= Dilution Factor
A_u	= Area of target analyte
I_{is}	= Mass of specific internal standard (ng)
V_i	= Volume of extract (μL)
A_{is}	= Area of specific internal standard
RF	= Response Factor (unitless)
RF_{ave}	= average Response Factor
V_i	= Volume of extract injected (μL)
V_o	= Volume of sample (mL)

The RF_{ave} is used when a sample is associated with an initial calibration curve. The RF is used when a sample is associated with a continuing calibration curve.

Response Factor calculation:

The RF for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_c \times I_{is}}{A_{is} \times I_c}$$

where

RF	= Response factor for a specific analyte
A_c	= Area of the analyte in the standard
I_{is}	= Mass of the specific internal standard
A_{is}	= Area of the specific internal standard
I_c	= Mass of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + \dots + RF_n}{n}$$

and

n = number of Samples

Rev. 7/11/94

Analytical Procedure for PCB in Water

Extraction Procedure

One liter of sample (100 mL of sample A-C27629) was spiked with a surrogate solution consisting of tetrachloro-m-xylene and decachlorobiphenyl, and was extracted three times with 60-mL portions of methylene chloride. The combined extracts were filtered, concentrated to 10 mL, solvent exchanged with 60-mL hexane, and the hexane concentrated to 1.0 mL.

Gas Chromatographic Analysis

The extract was analyzed for PCB aroclors using simultaneous dual column injections. The analysis was done on an HP 6890 GC/ECD system, equipped with an HP 6890 automatic sampler. The system was controlled with an HP-ChemStation. The following conditions were employed:

First Column	DB-608, 30 meter, 0.32mm fused silica capillary, 0.50 µm film thickness
Injector Temperature	200° C
Detector Temperature	325° C
Second Column	Rtx-CLPesticides, 30 meter, 0.32mm fused silica capillary, 0.50 µm film thickness
Injector Temperature	200° C
Detector Temperature	325° C
Temperature Program - (6890)	120 ° C for 1 minute 9 °C/min to 285°C, 10 min at 285°C
Injection volume - (6890)	1 µL

The gas chromatographs were calibrated using 5 PCB aroclor standards at 250, 500, 1000, 2000, and 5000 µg/L. Five representative peaks were selected and their responses were used to calculate response factors (RF). The average of the 5 RFs was used to calculate the concentrations of the aroclor in the samples. Quantification was based on the DB-608 column (signal 1), and identity of the analyte was confirmed using the Rtx-CLPesticides column (signal 2). A fingerprint chromatogram was produced for eight different aroclors; calibration curves were run only if a particular aroclor was identified in a sample.

The PCB results, listed in Table 1.5, were calculated from the following formula:

$$C_u = \frac{DF \times A_u \times V_t}{RF_{ave} \times V_i \times V_s}$$

where

C_u	= Concentration of analyte ($\mu\text{g/L}$)
DF	= Dilution Factor
A_u	= Area or peak height
V_t	= Final volume of sample extract (mL)
RF_{ave}	= Average response factor
V_i	= Volume of extract injected (μL)
V_s	= Sample volume extracted (mL)

Response Factor calculation:

The RF for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_u}{\text{total pg injected}}$$

where

A_u = Area or peak height

and

$$RF_{ave} = \frac{RF_1 + \dots + RF_n}{n}$$

where

n = number of samples

Revision date: 2/29/00

**Table 1.1 Results of the Analysis for VOC in Water
WA# 0-107, Jard Co. Site**

Sample #	Water blank 020400-2	E-G27627 Bailer blank AV1405.D	A-D27628 Trip blank AV1406.D	E-G27607 MW-2 AV1407.D
Location	AV1404.D	1.0 µg/L	1.0 µg/L	1.0 µg/L
Dil. Fact.	1.0			
Unit				
Compound	Conc.	MDL	Conc.	MDL
Dichlorodifluoromethane	U	1.0	U	1.0
Chloromethane	U	1.0	U	1.0
Vinyl Chloride	U	1.0	U	1.0
Bromomethane	U	2.0	U	2.0
Chloroethane	U	1.0	U	1.0
Trichlorofluoromethane	U	1.0	U	1.0
Acetone	U	8.0	3.2	J
1,1-Dichloroethene	U	1.0	U	1.0
Methylene Chloride	U	1.0	U	1.0
Carbon Disulfide	U	1.0	U	1.0
Methyl-t-butyl Ether	U	1.0	U	1.0
trans-1,2-Dichloroethene	U	1.0	U	1.0
1,1-Dichloroethane	U	1.0	U	1.0
2-Butanone	U	4.0	U	4.0
2,2-Dichloropropane	U	1.0	U	1.0
cis-1,2-Dichloroethene	U	1.0	U	1.0
Chloroform	U	1.0	U	1.0
1,1-Dichloropropene	U	1.0	U	1.0
1,2-Dichloroethane	U	1.0	U	1.0
1,1,1-Trichloroethane	U	1.0	U	1.0
Carbon Tetrachloride	U	1.0	U	1.0
Benzene	U	1.0	U	1.0
Trichloroethene	U	1.0	U	1.0
1,2-Dichloropropane	U	1.0	U	1.0
Bromodichloromethane	U	1.0	U	1.0
Dibromomethane	U	1.0	U	1.0
cis-1,3-Dichloropropene	U	1.0	U	1.0
trans-1,3-Dichloropropene	U	1.0	U	1.0
1,1,2-Trichloroethane	U	1.0	U	1.0
1,3-Dichloropropane	U	1.0	U	1.0
Dibromochloromethane	U	1.0	U	1.0
1,2-Dibromoethane	U	1.0	U	1.0
Bromoform	U	1.0	U	1.0
4-Methyl-2-Pentanone	U	2.0	U	2.0
Toluene	U	1.0	U	1.0
2-Hexanone	U	2.0	U	2.0
Tetrachloroethene	U	1.0	U	1.0
Chlorobenzene	U	1.0	U	1.0
1,1,1,2-Tetrachloroethane	U	1.0	U	1.0
Ethylbenzene	U	1.0	U	1.0
p&m-Xylene	U	1.0	U	1.0
o-Xylene	U	1.0	U	1.0
Styrene	U	1.0	U	1.0
Isopropylbenzene	U	1.0	U	1.0
1,1,2,2-Tetrachloroethane	U	1.0	U	1.0
1,2,3-Trichloropropane	U	1.0	U	1.0
n-Propylbenzene	U	1.0	U	1.0
Bromobenzene	U	1.0	U	1.0
1,3,5-Trimethylbenzene	U	1.0	U	1.0
2-Chlorotoluene	U	1.0	U	1.0
4-Chlorotoluene	U	1.0	U	1.0
tert-Butylbenzene	U	1.0	U	1.0
1,2,4-Trimethylbenzene	U	1.0	U	1.0
sec-Butylbenzene	U	1.0	U	1.0
p-Isopropyltoluene	U	1.0	U	1.0
1,3-Dichlorobenzene	U	1.0	U	1.0
1,4-Dichlorobenzene	U	1.0	U	1.0
n-Butylbenzene	U	1.0	U	1.0
1,2-Dichlorobenzene	U	1.0	U	1.0
1,2-Dibromo-3-chloropropane	U	1.0	U	1.0
1,2,4-Trichlorobenzene	U	1.0	U	1.0
Hexachlorobutadiene	U	1.0	U	1.0
Naphthalene	U	1.0	U	1.0
1,2,3-Trichlorobenzene	U	1.0	U	1.0

**Table 1.1(cont.) Results of the Analysis for VOC in Water
WA# 0-107, Jard Co. Site**

Sample #	Water blank 020400-2	E-G27608	E-G27609	E-G27610
Location	EPA-3	EPA-4	EPA-4 Dup	
File	AV1404.D	AV1408.D	AV1409.D	
Dil. Fact.	1.0	1.0	1.0	1.0
Unit	µg/L	µg/L	µg/L	µg/L
Compound	Conc.	MDL	Conc.	MDL
Dichlorodifluoromethane	U	1.0	U	1.0
Chloromethane	U	1.0	U	1.0
Vinyl Chloride	U	1.0	U	1.0
Bromomethane	U	2.0	U	2.0
Chloroethane	U	1.0	U	1.0
Trichlorofluoromethane	U	1.0	U	1.0
Acetone	U	8.0	2.6	J
1,1-Dichloroethene	U	1.0	U	1.0
Methylene Chloride	U	1.0	U	1.0
Carbon Disulfide	U	1.0	U	1.0
Methyl-t-butyl Ether	U	1.0	U	1.0
trans-1,2-Dichloroethene	U	1.0	U	1.0
1,1-Dichloroethane	U	1.0	U	1.0
2-Butanone	U	4.0	U	4.0
2,2-Dichloropropane	U	1.0	U	1.0
cis-1,2-Dichloroethene	U	1.0	U	1.0
Chloroform	U	1.0	U	1.0
1,1-Dichloropropene	U	1.0	U	1.0
1,2-Dichloroethane	U	1.0	U	1.0
1,1,1-Trichloroethane	U	1.0	U	1.0
Carbon Tetrachloride	U	1.0	U	1.0
Benzene	U	1.0	U	1.0
Trichloroethene	U	1.0	U	1.0
1,2-Dichloropropane	U	1.0	U	1.0
Bromodichloromethane	U	1.0	U	1.0
Dibromomethane	U	1.0	U	1.0
cis-1,3-Dichloropropene	U	1.0	U	1.0
trans-1,3-Dichloropropene	U	1.0	U	1.0
1,1,2-Trichloroethane	U	1.0	U	1.0
1,3-Dichloropropane	U	1.0	U	1.0
Dibromochloromethane	U	1.0	U	1.0
1,2-Dibromoethane	U	1.0	U	1.0
Bromoform	U	1.0	U	1.0
4-Methyl-2-Pentanone	U	2.0	U	2.0
Toluene	U	1.0	U	1.0
2-Hexanone	U	2.0	U	2.0
Tetrachloroethene	U	1.0	U	1.0
Chlorobenzene	U	1.0	U	1.0
1,1,1,2-Tetrachloroethane	U	1.0	U	1.0
Ethylbenzene	U	1.0	U	1.0
p&m-Xylene	U	1.0	U	1.0
o-Xylene	U	1.0	U	1.0
Styrene	U	1.0	U	1.0
Isopropylbenzene	U	1.0	U	1.0
1,1,2,2-Tetrachloroethane	U	1.0	U	1.0
1,2,3-Trichloropropane	U	1.0	U	1.0
n-Propylbenzene	U	1.0	U	1.0
Bromobenzene	U	1.0	U	1.0
1,3,5-Trimethylbenzene	U	1.0	U	1.0
2-Chlorotoluene	U	1.0	U	1.0
4-Chlorotoluene	U	1.0	U	1.0
tert-Butylbenzene	U	1.0	U	1.0
1,2,4-Trimethylbenzene	U	1.0	U	1.0
sec-Butylbenzene	U	1.0	U	1.0
p-Isopropyltoluene	U	1.0	U	1.0
1,3-Dichlorobenzene	U	1.0	U	1.0
1,4-Dichlorobenzene	U	1.0	U	1.0
n-Butylbenzene	U	1.0	U	1.0
1,2-Dichlorobenzene	U	1.0	U	1.0
1,2-Dibromo-3-chloropropane	U	1.0	U	1.0
1,2,4-Trichlorobenzene	U	1.0	U	1.0
Hexachlorobutadiene	U	1.0	U	1.0
Naphthalene	U	1.0	U	1.0
1,2,3-Trichlorobenzene	U	1.0	U	1.0

**Table 1.1(cont.) Results of the Analysis for VOC in Water
WA# 0-107, Jard Co. Site**

Sample #	Water blank 020400-2	E-G27611 EPA-5	E-G27614 EPA-6	E-G27615 EPA-7
Location	AV1404.D	AV1411.D	AV1412.D	AV1413.D
Dil. Fact.	1.0	1.0	1.0	1.0
Unit	µg/L	µg/L	µg/L	µg/L
<u>Compound</u>	<u>Conc.</u>	<u>MDL</u>	<u>Conc.</u>	<u>MDL</u>
Dichlorodifluoromethane	U	1.0	U	1.0
Chloromethane	U	1.0	U	1.0
Vinyl Chloride	U	1.0	U	1.0
Bromomethane	U	2.0	U	2.0
Chloroethane	U	1.0	U	1.0
Trichlorofluoromethane	U	1.0	U	1.0
Acetone	U	8.0	2.5	J
1,1-Dichloroethene	U	1.0	U	1.0
Methylene Chloride	U	1.0	U	1.0
Carbon Disulfide	U	1.0	U	1.0
Methyl-t-butyl Ether	U	1.0	U	1.0
trans-1,2-Dichloroethene	U	1.0	U	1.0
1,1-Dichloroethane	U	1.0	U	1.0
2-Butanone	U	4.0	U	4.0
2,2-Dichloropropane	U	1.0	U	1.0
cis-1,2-Dichloroethene	U	1.0	U	1.0
Chloroform	U	1.0	U	1.0
1,1-Dichloropropene	U	1.0	U	1.0
1,2-Dichloroethane	U	1.0	U	1.0
1,1,1-Trichloroethane	U	1.0	U	1.0
Carbon Tetrachloride	U	1.0	U	1.0
Benzene	U	1.0	U	1.0
Trichloroethene	U	1.0	U	1.0
1,2-Dichloropropene	U	1.0	U	1.0
Bromodichloromethane	U	1.0	U	1.0
Dibromomethane	U	1.0	U	1.0
cis-1,3-Dichloropropene	U	1.0	U	1.0
trans-1,3-Dichloropropene	U	1.0	U	1.0
1,1,2-Trichloroethane	U	1.0	U	1.0
1,3-Dichloropropene	U	1.0	U	1.0
Dibromochloromethane	U	1.0	U	1.0
1,2-Dibromoethane	U	1.0	U	1.0
Bromoform	U	1.0	U	1.0
4-Methyl-2-Pentanone	U	2.0	U	2.0
Toluene	U	1.0	U	1.0
2-Hexanone	U	2.0	U	2.0
Tetrachloroethene	U	1.0	U	1.0
Chlorobenzene	U	1.0	U	1.0
1,1,1,2-Tetrachloroethane	U	1.0	U	1.0
Ethylbenzene	U	1.0	U	1.0
p&m-Xylene	U	1.0	U	1.0
o-Xylene	U	1.0	U	1.0
Styrene	U	1.0	U	1.0
Isopropylbenzene	U	1.0	U	1.0
1,1,2,2-Tetrachloroethane	U	1.0	U	1.0
1,2,3-Trichloropropane	U	1.0	U	1.0
n-Propylbenzene	U	1.0	U	1.0
Bromobenzene	U	1.0	U	1.0
1,3,5-Trimethylbenzene	U	1.0	U	1.0
2-Chlorotoluene	U	1.0	U	1.0
4-Chlorotoluene	U	1.0	U	1.0
tert-Butylbenzene	U	1.0	U	1.0
1,2,4-Trimethylbenzene	U	1.0	U	1.0
sec-Butylbenzene	U	1.0	U	1.0
p-Isopropyltoluene	U	1.0	U	1.0
1,3-Dichlorobenzene	U	1.0	U	1.0
1,4-Dichlorobenzene	U	1.0	U	1.0
n-Butylbenzene	U	1.0	U	1.0
1,2-Dichlorobenzene	U	1.0	U	1.0
1,2-Dibromo-3-chloropropane	U	1.0	U	1.0
1,2,4-Trichlorobenzene	U	1.0	U	1.0
Hexachlorobutadiene	U	1.0	U	1.0
Naphthalene	U	1.0	U	1.0
1,2,3-Trichlorobenzene	U	1.0	U	1.0

**Table 1.1(cont.) Results of the Analysis for VOC in Water
WA# 0-107, Jard Co. Site**

Sample #	Water blank 020900	E-G27616	E-G27618	E-G27617
Location	EPA-8	MW-1	MW-4	
File	BV1061.D	BV1062.D	BV1063.D	
Dil. Fact.	1.0	1.0	1.0	1.0
Unit	µg/L	µg/L	µg/L	µg/L
Compound	Conc.	MDL	Conc.	MDL
Dichlorodifluoromethane	U	1.0	U	1.0
Chloromethane	U	1.0	U	1.0
Vinyl Chloride	U	1.0	U	1.0
Bromomethane	U	2.0	U	2.0
Chloroethane	U	1.0	U	1.0
Trichlorofluoromethane	U	1.0	U	1.0
Acetone	U	8.0	3.8	J
1,1-Dichloroethene	U	1.0	U	1.0
Methylene Chloride	U	1.0	U	1.0
Carbon Disulfide	U	1.0	U	1.0
Methyl-t-butyl Ether	U	1.0	U	1.0
trans-1,2-Dichloroethene	U	1.0	U	1.0
1,1-Dichloroethane	U	1.0	U	1.0
2-Butanone	U	4.0	U	4.0
2,2-Dichloropropane	U	1.0	U	1.0
cis-1,2-Dichloroethene	U	1.0	U	1.0
Chloroform	U	1.0	U	1.0
1,1-Dichloropropene	U	1.0	U	1.0
1,2-Dichloroethane	U	1.0	U	1.0
1,1,1-Trichloroethane	U	1.0	U	1.0
Carbon Tetrachloride	U	1.0	U	1.0
Benzene	U	1.0	U	1.0
Trichloroethene	U	1.0	U	1.0
1,2-Dichloropropane	U	1.0	U	1.0
Bromodichloromethane	U	1.0	U	1.0
Dibromomethane	U	1.0	U	1.0
cis-1,3-Dichloropropene	U	1.0	U	1.0
trans-1,3-Dichloropropene	U	1.0	U	1.0
1,1,2-Trichloroethane	U	1.0	U	1.0
1,3-Dichloropropane	U	1.0	U	1.0
Dibromochloromethane	U	1.0	U	1.0
1,2-Dibromoethane	U	1.0	U	1.0
Bromoform	U	1.0	U	1.0
4-Methyl-2-Pentanone	U	2.0	U	2.0
Toluene	U	1.0	U	1.0
2-Hexanone	U	2.0	U	2.0
Tetrachloroethene	U	1.0	U	1.0
Chlorobenzene	U	1.0	U	1.0
1,1,1,2-Tetrachloroethane	U	1.0	U	1.0
Ethylbenzene	U	1.0	U	1.0
p&m-Xylene	U	1.0	U	1.0
o-Xylene	U	1.0	U	1.0
Styrene	U	1.0	U	1.0
Isopropylbenzene	U	1.0	U	1.0
1,1,2,2-Tetrachloroethane	U	1.0	U	1.0
1,2,3-Trichloropropane	U	1.0	U	1.0
n-Propylbenzene	U	1.0	U	1.0
Bromobenzene	U	1.0	U	1.0
1,3,5-Trimethylbenzene	U	1.0	U	1.0
2-Chlorotoluene	U	1.0	U	1.0
4-Chlorotoluene	U	1.0	U	1.0
tert-Butylbenzene	U	1.0	U	1.0
1,2,4-Trimethylbenzene	U	1.0	U	1.0
sec-Butylbenzene	U	1.0	U	1.0
p-Isopropyltoluene	U	1.0	U	1.0
1,3-Dichlorobenzene	U	1.0	U	1.0
1,4-Dichlorobenzene	U	1.0	U	1.0
n-Butylbenzene	U	1.0	U	1.0
1,2-Dichlorobenzene	U	1.0	U	1.0
1,2-Dibromo-3-chloropropane	U	1.0	U	1.0
1,2,4-Trichlorobenzene	U	1.0	U	1.0
Hexachlorobutadiene	1.4	1.0	U	1.0
Naphthalene	U	1.0	U	1.0
1,2,3-Trichlorobenzene	U	1.0	U	1.0

**Table 1.1(cont.) Results of the Analysis for VOC in Water
WA# 0-107, Jard Co. Site**

Sample #	Water blank 020900	E-G27619	E-G27621	E-G27624
Location	MW-6	EPA-2	EPA-9	
File	BV1061.D	BV1065.D	BV1066.D	
Dil. Fact.	1.0	1.0	1.0	1.0
Unit	µg/L	µg/L	µg/L	µg/L
Compound	Conc.	MDL	Conc.	MDL
Dichlorodifluoromethane	U	1.0	U	1.0
Chloromethane	U	1.0	U	1.0
Vinyl Chloride	U	1.0	U	1.0
Bromomethane	U	2.0	U	2.0
Chloroethane	U	1.0	2.8	1.0
Trichlorofluoromethane	U	1.0	U	1.0
Acetone	U	8.0	3.8	J
1,1-Dichloroethene	U	1.0	U	1.0
Methylene Chloride	U	1.0	U	1.0
Carbon Disulfide	U	1.0	U	1.0
Methyl-t-butyl Ether	U	1.0	U	1.0
trans-1,2-Dichloroethene	U	1.0	U	1.0
1,1-Dichloroethane	U	1.0	4.4	1.0
2-Butanone	U	4.0	U	4.0
2,2-Dichloropropane	U	1.0	U	1.0
cis-1,2-Dichloroethene	U	1.0	1.3	1.0
Chloroform	U	1.0	U	1.0
1,1-Dichloropropene	U	1.0	U	1.0
1,2-Dichloroethane	U	1.0	U	1.0
1,1,1-Trichloroethane	U	1.0	U	1.0
Carbon Tetrachloride	U	1.0	U	1.0
Benzene	U	1.0	U	1.0
Trichloroethene	U	1.0	U	1.0
1,2-Dichloropropane	U	1.0	U	1.0
Bromodichloromethane	U	1.0	U	1.0
Dibromomethane	U	1.0	U	1.0
cis-1,3-Dichloropropene	U	1.0	U	1.0
trans-1,3-Dichloropropene	U	1.0	U	1.0
1,1,2-Trichloroethane	U	1.0	U	1.0
1,3-Dichloropropane	U	1.0	U	1.0
Dibromochloromethane	U	1.0	U	1.0
1,2-Dibromoethane	U	1.0	U	1.0
Bromoform	U	1.0	U	1.0
4-Methyl-2-Pentanone	U	2.0	U	2.0
Toluene	U	1.0	U	1.0
2-Hexanone	U	2.0	U	2.0
Tetrachloroethene	U	1.0	U	1.0
Chlorobenzene	U	1.0	U	1.0
1,1,1,2-Tetrachloroethane	U	1.0	U	1.0
Ethylbenzene	U	1.0	U	1.0
p&m-Xylene	U	1.0	U	1.0
o-Xylene	U	1.0	U	1.0
Styrene	U	1.0	U	1.0
Isopropylbenzene	U	1.0	U	1.0
1,1,2,2-Tetrachloroethane	U	1.0	U	1.0
1,2,3-Trichloropropane	U	1.0	U	1.0
n-Propylbenzene	U	1.0	U	1.0
Bromobenzene	U	1.0	U	1.0
1,3,5-Trimethylbenzene	U	1.0	U	1.0
2-Chlorotoluene	U	1.0	U	1.0
4-Chlorotoluene	U	1.0	U	1.0
tert-Butylbenzene	U	1.0	U	1.0
1,2,4-Trimethylbenzene	U	1.0	U	1.0
sec-Butylbenzene	U	1.0	U	1.0
p-Isopropyltoluene	U	1.0	U	1.0
1,3-Dichlorobenzene	U	1.0	1.3	1.0
1,4-Dichlorobenzene	U	1.0	8.6	1.0
n-Butylbenzene	U	1.0	U	1.0
1,2-Dichlorobenzene	U	1.0	U	1.0
1,2-Dibromo-3-chloropropane	U	1.0	U	1.0
1,2,4-Trichlorobenzene	U	1.0	U	1.0
Hexachlorobutadiene	1.4	1.0	U	1.0
Naphthalene	U	1.0	U	1.0
1,2,3-Trichlorobenzerene	U	1.0	U	1.0

**Table 1.1(cont.) Results of the Analysis for VOC in Water
WA# 0-107, Jard Co. Site**

Sample #	Water blank 020900	E-G27625	E-G27626	E-G27620
Location	EPA-10	EPA-10 Dup	EPA-1	
File	BV1061.D	BV1068.D	BV1069.D	BV1076.D
Dil. Fact.	1.0	1.0	1.0	1.0
Unit	µg/L	µg/L	µg/L	µg/L
Compound	Conc.	MDL	Conc.	MDL
Dichlorodifluoromethane	U	1.0	U	1.0
Chloromethane	U	1.0	U	1.0
Vinyl Chloride	U	1.0	U	1.0
Bromomethane	U	2.0	U	2.0
Chloroethane	U	1.0	U	1.0
Trichlorofluoromethane	U	1.0	U	1.0
Acetone	U	8.0	4.0	J
1,1-Dichloroethene	U	1.0	U	1.0
Methylene Chloride	U	1.0	U	1.0
Carbon Disulfide	U	1.0	U	1.0
Methyl-t-butyl Ether	U	1.0	U	1.0
trans-1,2-Dichloroethene	U	1.0	U	1.0
1,1-Dichloroethane	U	1.0	U	1.0
2-Butanone	U	4.0	U	4.0
2,2-Dichloropropane	U	1.0	U	1.0
cis-1,2-Dichloroethene	U	1.0	U	1.0
Chloroform	U	1.0	U	1.0
1,1-Dichloropropene	U	1.0	U	1.0
1,2-Dichloroethane	U	1.0	U	1.0
1,1,1-Trichloroethane	U	1.0	U	1.0
Carbon Tetrachloride	U	1.0	U	1.0
Benzene	U	1.0	U	1.0
Trichloroethene	U	1.0	U	1.0
1,2-Dichloropropane	U	1.0	U	1.0
Bromodichloromethane	U	1.0	U	1.0
Dibromomethane	U	1.0	U	1.0
cis-1,3-Dichloropropene	U	1.0	U	1.0
trans-1,3-Dichloropropene	U	1.0	U	1.0
1,1,2-Trichloroethane	U	1.0	U	1.0
1,3-Dichloropropane	U	1.0	U	1.0
Dibromochloromethane	U	1.0	U	1.0
1,2-Dibromoethane	U	1.0	U	1.0
Bromoform	U	1.0	U	1.0
4-Methyl-2-Pentanone	U	2.0	U	2.0
Toluene	U	1.0	U	1.0
2-Hexanone	U	2.0	U	2.0
Tetrachloroethene	U	1.0	U	1.0
Chlorobenzene	U	1.0	U	1.0
1,1,1,2-Tetrachloroethane	U	1.0	U	1.0
Ethylbenzene	U	1.0	U	1.0
p&m-Xylene	U	1.0	U	1.0
o-Xylene	U	1.0	U	1.0
Styrene	U	1.0	U	1.0
Isopropylbenzene	U	1.0	U	1.0
1,1,2,2-Tetrachloroethane	U	1.0	U	1.0
1,2,3-Trichloropropane	U	1.0	U	1.0
n-Propylbenzene	U	1.0	U	1.0
Bromobenzene	U	1.0	U	1.0
1,3,5-Trimethylbenzene	U	1.0	U	1.0
2-Chlorotoluene	U	1.0	U	1.0
4-Chlorotoluene	U	1.0	U	1.0
tert-Butylbenzene	U	1.0	U	1.0
1,2,4-Trimethylbenzene	U	1.0	U	1.0
sec-Butylbenzene	U	1.0	U	1.0
p-Isopropyltoluene	U	1.0	U	1.0
1,3-Dichlorobenzene	U	1.0	U	1.0
1,4-Dichlorobenzene	U	1.0	U	1.0
n-Butylbenzene	U	1.0	U	1.0
1,2-Dichlorobenzene	U	1.0	U	1.0
1,2-Dibromo-3-chloropropane	U	1.0	U	1.0
1,2,4-Trichlorobenzene	U	1.0	U	1.0
Hexachlorobutadiene	1.4	1.0	U	1.0
Naphthalene	U	1.0	U	1.0
1,2,3-Trichlorobenzene	U	1.0	U	1.0

Table 1.2 Results of TIC for VOC in Water

WA# 0-107, Jard Co. Site

Sample #	Compound
Water blank 020400-2	No Peaks Found
E-G27627	No Peaks Found
A-D27628	No Peaks Found
E-G27607	No Peaks Found
E-G27608	No Peaks Found
E-G27609	No Peaks Found
E-G27610	No Peaks Found
E-G27611	No Peaks Found
E-G27614	No Peaks Found
E-G27615	No Peaks Found
Water blank 020900	No Peaks Found
E-G27616	No Peaks Found
E-G27618	No Peaks Found
E-G27617	No Peaks Found
E-G27619	No Peaks Found
E-G27621	No Peaks Found
E-G27624	No Peaks Found
E-G27625	No Peaks Found
E-G27626	No Peaks Found

Table 1.2 (cont.) Results of TIC for VOC in Water

WA# 0-107, Jard Co. Site

Sample #	E-G27620	Unit	µg/L
LabFile#	BV1076	Con. Factor	1.0

	CAS#	Compound	Q	RT	Conc
1		C3 Alkene		2.13	79
2		C4 Alkene		2.90	25
3		Possible 1,3-butadiene		3.06	6
4		C5 Cyclo alkane		5.04	7
5		Possible 2-methyl-1,3-butadiene		5.58	7
6		C8 Alcohol		19.94	66
7					0
8					0
9					0
10					0
11					0
12					0
13					0
14					0
15					0
16					0
17					0
18					0
19					0
20					0

*Estimated Concentration (Response Factor = 1.0)

**Table 1.3 Results of the Analysis for BNA in Water
WA # 0-107 Jard Co. Site**

Sample No.	WBLK020800	C-D27607 MW-2 JAR003	C-D27608 EPA-3 JAR004	C-D27609 EPA-4 JAR005	C-D27610 EPA-4 Dup JAR006
Sample Location	Lab Blank JAR002	1	1	1	1
GC/MS File Name					
Dilution Factor					
Compound Name	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L
Phenol	U	10	U	10	U
bis(-2-Chloroethyl)Ether	U	10	U	10	U
2-Chlorophenol	U	10	U	10	U
1,3-Dichlorobenzene	U	10	U	10	U
1,4-Dichlorobenzene	U	10	U	10	U
Benzyl alcohol	U	10	U	10	U
1,2-Dichlorobenzene	U	10	U	10	U
2-Methylphenol	U	10	U	10	U
bis(2-Chloroisopropyl)ether	U	10	U	10	U
4-Methylphenol	U	10	U	10	U
N-Nitroso-Di-n-propylamine	U	10	U	10	U
Hexachloroethane	U	10	U	10	U
Nitrobenzene	U	10	U	10	U
Isophorone	U	10	U	10	U
2-Nitrophenol	U	10	U	10	U
2,4-Dimethylphenol	U	10	U	10	U
bis(2-Chloroethoxy)methane	U	10	U	10	U
2,4-Dichlorophenol	U	10	U	10	U
1,2,4-Trichlorobenzene	U	10	U	10	U
Naphthalene	U	10	U	10	U
4-Chloroaniline	U	10	U	10	U
Hexachlorobutadiene	U	10	U	10	U
4-Chloro-3-methylphenol	U	10	U	10	U
2-Methylnaphthalene	U	10	U	10	U
Hexachlorocyclopentadiene	U	10	U	10	U
2,4,6-Trichlorophenol	U	10	U	10	U
2,4,5-Trichlorophenol	U	10	U	10	U
2-Chloronaphthalene	U	10	U	10	U
2-Nitroaniline	U	10	U	10	U
Dimethylphthalate	U	10	U	10	U
Acenaphthylene	U	10	U	10	U
2,6-Dinitrotoluene	U	10	U	10	U
3-Nitroaniline	U	10	U	10	U
Acenaphthene	U	10	U	10	U
2,4-Dinitrophenol	U	10	U	10	U
4-Nitrophenol	U	10	U	10	U
Dibenzofuran	U	10	U	10	U
2,4-Dinitrotoluene	U	10	U	10	U
Diethylphthalate	U	10	U	10	U
4-Chlorophenyl-phenylether	U	10	U	10	U
Fluorene	U	10	U	10	U
4-Nitroaniline	U	10	U	10	U
4,6-Dinitro-2-methylphenol	U	10	U	10	U
N-Nitrosodiphenylamine	U	10	U	10	U
4-Bromophenyl-phenylether	U	10	U	10	U
Hexachlorobenzene	U	10	U	10	U
Pentachlorophenol	U	10	U	10	U
Phenanthrene	U	10	U	10	U
Anthracene	U	10	U	10	U
Carbazole	U	10	U	10	U
Di-n-butylphthalate	U	10	U	10	U
Fluoranthene	U	10	U	10	U
Pyrene	U	10	U	10	U
Butylbenzylphthalate	U	10	U	10	U
Benzo(a)anthracene	U	10	U	10	U
3,3'-Dichlorobenzidine	U	10	U	10	U
Chrysene	U	10	U	10	U
Bis(2-Ethylhexyl)phthalate	U	10	U	10	U
Di-n-octylphthalate	U	10	U	10	U
Benzo(b)fluoranthene	U	10	U	10	U
Benzo(k)fluoranthene	U	10	U	10	U
Benz(a)pyrene	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	U	10	U	10	U
Dibenzo(a,h)anthracene	U	10	U	10	U
Benzog(h,i)perylene	U	10	U	10	U

Table 1.3 (cont.) Results of the Analysis for BNA in Water
WA # 0-107 Jard Co. Site

Sample No.	C-D27611 EPA-5 JAR007 1	C-D27614 EPA-6 JAR008 1	C-D27615 EPA-7 JAR009 1	C-D27616 EPA-8 JAR010 1	C-D27618 MW-1 JAR011 1					
Compound Name	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L
Phenol	U	10	U	10	U	10	U	10	U	10
bis(-2-Chloroethyl)Ether	U	10	U	10	U	10	U	10	U	10
2-Chlorophenol	U	10	U	10	U	10	U	10	U	10
1,3-Dichlorobenzene	U	10	U	10	U	10	U	10	U	10
1,4-Dichlorobenzene	U	10	U	10	U	10	U	10	U	10
Benzyl alcohol	U	10	U	10	U	10	U	10	U	10
1,2-Dichlorobenzene	U	10	U	10	U	10	U	10	U	10
2-Methylphenol	U	10	U	10	U	10	U	10	U	10
bis(2-Chloroisopropyl)ether	U	10	U	10	U	10	U	10	U	10
4-Methylphenol	U	10	U	10	U	10	U	10	U	10
N-Nitroso-Di-n-propylamine	U	10	U	10	U	10	U	10	U	10
Hexachloroethane	U	10	U	10	U	10	U	10	U	10
Nitrobenzene	U	10	U	10	U	10	U	10	U	10
Isophorone	U	10	U	10	U	10	U	10	U	10
2-Nitrophenol	U	10	U	10	U	10	U	10	U	10
2,4-Dimethylphenol	U	10	U	10	U	10	U	10	U	10
bis(2-Chloroethoxy)methane	U	10	U	10	U	10	U	10	U	10
2,4-Dichlorophenol	U	10	U	10	U	10	U	10	U	10
1,2,4-Trichlorobenzene	U	10	U	10	U	10	U	10	U	10
Naphthalene	U	10	U	10	U	10	U	10	U	10
4-Chloroaniline	U	10	U	10	U	10	U	10	U	10
Hexachlorobutadiene	U	10	U	10	U	10	U	10	U	10
4-Chloro-3-methylphenol	U	10	U	10	U	10	U	10	U	10
2-Methylnaphthalene	U	10	U	10	U	10	U	10	U	10
Hexachlorocyclopentadiene	U	10	U	10	U	10	U	10	U	10
2,4,6-Trichlorophenol	U	10	U	10	U	10	U	10	U	10
2,4,5-Trichlorophenol	U	10	U	10	U	10	U	10	U	10
2-Chloronaphthalene	U	10	U	10	U	10	U	10	U	10
2-Nitroaniline	U	10	U	10	U	10	U	10	U	10
Dimethylphthalate	U	10	U	10	U	10	U	10	U	10
Acenaphthylene	U	10	U	10	U	10	U	10	U	10
2,6-Dinitrotoluene	U	10	U	10	U	10	U	10	U	10
3-Nitroaniline	U	10	U	10	U	10	U	10	U	10
Acenaphthene	U	10	U	10	U	10	U	10	U	10
2,4-Dinitrophenol	U	10	U	10	U	10	U	10	U	10
4-Nitrophenol	U	10	U	10	U	10	U	10	U	10
Dibenzofuran	U	10	U	10	U	10	U	10	U	10
2,4-Dinitrotoluene	U	10	U	10	U	10	U	10	U	10
Diethylphthalate	U	10	U	10	U	10	U	10	U	10
4-Chlorophenyl-phenylether	U	10	U	10	U	10	U	10	U	10
Fluorene	U	10	U	10	U	10	U	10	U	10
4-Nitroaniline	U	10	U	10	U	10	U	10	U	10
4,6-Dinitro-2-methylphenol	U	10	U	10	U	10	U	10	U	10
N-Nitrosodiphenylamine	U	10	U	10	U	10	U	10	U	10
4-Bromophenyl-phenylether	U	10	U	10	U	10	U	10	U	10
Hexachlorobenzene	U	10	U	10	U	10	U	10	U	10
Pentachlorophenol	U	10	U	10	U	10	U	10	U	10
Phenanthrene	U	10	U	10	U	10	U	10	U	10
Anthracene	U	10	U	10	U	10	U	10	U	10
Carbazole	U	10	U	10	U	10	U	10	U	10
Di-n-butylphthalate	U	10	U	10	U	10	U	10	U	10
Fluoranthene	U	10	U	10	U	10	U	10	U	10
Pyrene	U	10	U	10	U	10	U	10	U	10
Butylbenzylphthalate	U	10	U	10	U	10	U	10	U	10
Benz(a)anthracene	U	10	U	10	U	10	U	10	U	10
3,3'-Dichlorobenzidine	U	10	U	10	U	10	U	10	U	10
Chrysene	U	10	U	10	U	10	U	10	U	10
Bis(2-Ethyhexyl)phthalate	J	10	U	10	U	10	U	10	U	10
Di-n-octylphthalate	2	10	U	10	U	10	U	10	U	10
Benz(b)fluoranthene	U	10	U	10	U	10	U	10	U	10
Benz(k)fluoranthene	U	10	U	10	U	10	U	10	U	10
Benz(a)pyrene	U	10	U	10	U	10	U	10	U	10
Indeno(1,2,3-cd)pyrene	U	10	U	10	U	10	U	10	U	10
Dibenzo(a,h)anthracene	U	10	U	10	U	10	U	10	U	10
Benzo(g,h,i)perylene	U	10	U	10	U	10	U	10	U	10

**Table 1.3 (cont.) Results of the Analysis for BNA in Water
WA # 0-107 Jard Co. Site**

Sample No.	C-D27617	C-D27619	C-D27620	C-D27621	C-D27624					
Sample Location	MW-4	MW-6	EPA-1	EPA-2	EPA-9					
GC/MS File Name	JAR015	JAR016	JAR017	JAR025	JAR021					
Dilution Factor	1	1	5	1	1					
Compound Name	Conc. µg/L	MDL µg/L								
Phenol	U	10	U	10	U	50	U	10	U	10
bis(-2-Chloroethyl)Ether	U	10	U	10	U	50	U	10	U	10
2-Chlorophenol	U	10	U	10	U	50	U	10	U	10
1,3-Dichlorobenzene	U	10	U	10	27	J	50	U	10	U
1,4-Dichlorobenzene	U	10	4.6	J	10	240	50	U	10	U
Benzyl alcohol	U	10	U	10	U	50	U	10	U	10
1,2-Dichlorobenzene	U	10	U	10	12	J	50	U	10	U
2-Methylphenol	U	10	U	10	U	50	U	10	U	10
bis(2-Chloroisopropyl)ether	U	10	U	10	U	50	U	10	U	10
4-Methylphenol	U	10	U	10	14	J	50	U	10	U
N-Nitroso-Di-n-propylamine	U	10	U	10	U	50	U	10	U	10
Hexachloroethane	U	10	U	10	U	50	U	10	U	10
Nitrobenzene	U	10	U	10	U	50	U	10	U	10
Isophorone	U	10	U	10	U	50	U	10	U	10
2-Nitrophenol	U	10	U	10	U	50	U	10	U	10
2,4-Dimethylphenol	U	10	U	10	U	50	U	10	U	10
bis(2-Chloroethoxy)methane	U	10	U	10	U	50	U	10	U	10
2,4-Dichlorophenol	U	10	U	10	U	50	U	10	U	10
1,2,4-Trichlorobenzene	U	10	U	10	17	J	50	U	10	U
Naphthalene	U	10	U	10	U	50	U	10	U	10
4-Chloroaniline	U	10	U	10	U	50	U	10	U	10
Hexachlorobutadiene	U	10	U	10	U	50	U	10	U	10
4-Chloro-3-methylphenol	U	10	U	10	U	50	U	10	U	10
2-Methylnaphthalene	U	10	U	10	U	50	U	10	U	10
Hexachlorocyclopentadiene	U	10	U	10	U	50	U	10	U	10
2,4,6-Trichlorophenol	U	10	U	10	U	50	U	10	U	10
2,4,5-Trichlorophenol	U	10	U	10	U	50	U	10	U	10
2-Chloronaphthalene	U	10	U	10	U	50	U	10	U	10
2-Nitroaniline	U	10	U	10	U	50	U	10	U	10
Dimethylphthalate	U	10	U	10	U	50	U	10	U	10
Acenaphthylene	U	10	U	10	U	50	U	10	U	10
2,6-Dinitrotoluene	U	10	U	10	U	50	U	10	U	10
3-Nitroaniline	U	10	U	10	U	50	U	10	U	10
Acenaphthene	U	10	U	10	U	50	U	10	U	10
2,4-Dinitrophenol	U	10	U	10	U	50	U	10	U	10
4-Nitrophenol	U	10	U	10	U	50	U	10	U	10
Dibenzofuran	U	10	U	10	U	50	U	10	U	10
2,4-Dinitrotoluene	U	10	U	10	U	50	U	10	U	10
Diethylphthalate	U	10	U	10	U	50	U	10	U	10
4-Chlorophenyl-phenylether	U	10	U	10	U	50	U	10	U	10
Fluorene	U	10	2.1	J	10	280	50	U	10	U
4-Nitroaniline	U	10	U	10	U	50	U	10	U	10
4,6-Dinitro-2-methylphenol	U	10	U	10	U	50	U	10	U	10
N-Nitrosodiphenylamine	U	10	U	10	U	50	U	10	U	10
4-Bromophenyl-phenylether	U	10	U	10	U	50	U	10	U	10
Hexachlorobenzene	U	10	U	10	U	50	U	10	U	10
Pentachlorophenol	U	10	U	10	U	50	U	10	U	10
Phenanthrene	U	10	U	10	U	50	U	10	U	10
Anthracene	U	10	U	10	U	50	U	10	U	10
Carbazole	U	10	U	10	U	50	U	10	U	10
Di-n-butylphthalate	U	10	U	10	U	50	U	10	U	10
Fluoranthene	U	10	U	10	U	50	U	10	U	10
Pyrene	U	10	U	10	U	50	U	10	U	10
Butylbenzylphthalate	U	10	U	10	U	50000	U	10	U	10
Benzo(a)anthracene	U	10	U	10	U	50000	U	10	U	10
3,3'-Dichlorobenzidine	U	10	U	10	U	50000	U	10	U	10
Chrysene	U	10	U	10	U	50000	U	10	U	10
Bis(2-Ethylhexyl)phthalate	U	10	140	U	400000	50000	3.2	J	10	2.9
Di-n-octylphthalate	U	10	U	10	24	J	50	U	10	U
Benzo(b)fluoranthene	U	10	U	10	U	50	U	10	U	10
Benzo(k)fluoranthene	U	10	U	10	U	50	U	10	U	10
Benzo(a)pyrene	U	10	U	10	U	50	U	10	U	10
Indeno(1,2,3-cd)pyrene	U	10	U	10	U	50	U	10	U	10
Dibenzo(a,h)anthracene	U	10	U	10	U	50	U	10	U	10
Benzo(g,h,i)perylene	U	10	U	10	U	50	U	10	U	10

**Table 1.3 (cont.) Results of the Analysis for BNA in Water
WA # 0-107 Jard Co. Site**

Sample No.	C-D27625	EPA 10 JAR022	1	C-D27626	EPA 10 Dup JAR023	1	C-D27627	Baier Blank JAR024	1
Compound Name	Conc. µg/L	MDL µg/L		Conc. µg/L	MDL µg/L		Conc. µg/L	MDL µg/L	
Phenol	U	10		U	10		U	10	
bis(-2-Chloroethyl)Ether	U	10		U	10		U	10	
2-Chlorophenol	U	10		U	10		U	10	
1,3-Dichlorobenzene	U	10		U	10		U	10	
1,4-Dichlorobenzene	U	10		U	10		U	10	
Benzyl alcohol	U	10		U	10		U	10	
1,2-Dichlorobenzene	U	10		U	10		U	10	
2-Methylphenol	U	10		U	10		U	10	
bis(2-Chloroisopropyl)ether	U	10		U	10		U	10	
4-Methylphenol	U	10		U	10		U	10	
N-Nitroso-Di-n-propylamine	U	10		U	10		U	10	
Hexachloroethane	U	10		U	10		U	10	
Nitrobenzene	U	10		U	10		U	10	
Isophorone	U	10		U	10		U	10	
2-Nitrophenol	U	10		U	10		U	10	
2,4-Dimethylphenol	U	10		U	10		U	10	
bis(2-Chlorothoxy)methane	U	10		U	10		U	10	
2,4-Dichlorophenol	U	10		U	10		U	10	
1,2,4-Trichlorobenzene	U	10		U	10		U	10	
Naphthalene	U	10		U	10		U	10	
4-Chloroaniline	U	10		U	10		U	10	
Hexachlorobutadiene	U	10		U	10		U	10	
4-Chloro-3-methylphenol	U	10		U	10		U	10	
2-Methylnaphthalene	U	10		U	10		U	10	
Hexachlorocyclopentadiene	U	10		U	10		U	10	
2,4,6-Trichlorophenol	U	10		U	10		U	10	
2,4,5-Trichlorophenol	U	10		U	10		U	10	
2-Chloronaphthalene	U	10		U	10		U	10	
2-Nitroaniline	U	10		U	10		U	10	
Dimethylphthalate	U	10		U	10		U	10	
Acenaphthylene	U	10		U	10		U	10	
2,6-Dinitrotoluene	U	10		U	10		U	10	
3-Nitroaniline	U	10		U	10		U	10	
Acenaphthene	U	10		U	10		U	10	
2,4-Dinitrophenol	U	10		U	10		U	10	
4-Nitrophenol	U	10		U	10		U	10	
Dibenzofuran	U	10		U	10		U	10	
2,4-Dinitrotoluene	U	10		U	10		U	10	
Diethylphthalate	U	10		U	10		U	10	
4-Chlorophenyl-phenylether	U	10		U	10		U	10	
Fluorene	U	10		U	10		U	10	
4-Nitroaniline	U	10		U	10		U	10	
4,6-Dinitro-2-methylphenol	U	10		U	10		U	10	
N-Nitrosodiphenylamine	U	10		U	10		U	10	
4-Bromophenyl-phenylether	U	10		U	10		U	10	
Hexachlorobenzene	U	10		U	10		U	10	
Pentachlorophenol	U	10		U	10		U	10	
Phenanthrene	U	10		U	10		U	10	
Anthracene	U	10		U	10		U	10	
Carbazole	U	10		U	10		U	10	
Di-n-butylphthalate	U	10		U	10		U	10	
Fluoranthene	U	10		U	10		U	10	
Pyrene	U	10		U	10		U	10	
Butylbenzylphthalate	U	10		U	10		U	10	
Benzo(a)anthracene	U	10		U	10		U	10	
3,3'-Dichlorobenzidine	U	10		U	10		U	10	
Chrysene	U	10		U	10		U	10	
Bis(2-Ethylhexyl)phthalate	6.3	J	10	4.2	J	10	U	10	
Di-n-octylphthalate	U	10		U	10		U	10	
Benzo(b)fluoranthene	U	10		U	10		U	10	
Benzo(k)fluoranthene	U	10		U	10		U	10	
Benzo(a)pyrene	U	10		U	10		U	10	
Indeno(1,2,3-cd)pyrene	U	10		U	10		U	10	
Dibenz(a,h)anthracene	U	10		U	10		U	10	
Benzo(g,h,i)perylene	U	10		U	10		U	10	

Table 1.4 Results of TIC for BNA in Water
WA # 0-107 Jard Co. Site

Sample #	WBLK020800		Con. Factor	1.0	
LabFile#	JAR002		Conc.*		
	CAS#	Compound	Q	RT	Conc.*
1		Unknown acid		13.55	12
2					
3					
4					
5					
6					
7					
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9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

* Estimated Concentration (Response Factor = 1)

00022

Table 1.4 (cont.) Results of TIC for BNA in Water
WA # 0-107 Jard Co. Site

Sample #	C-D27607	LabFile#	JAR003	Con. Factor	1.0	Conc.*
	CAS#	Compound		Q	RT	µg/L
1		Unknown acid			13.55	4.8
2						
3						
4						
5						
6						
7						
8						
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11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water
WA # 0-107 Jard Co. Site

Sample #	C-D27608	Con. Factor	1.0
LabFile#	JAR004	Conc.*	μg/L
1	Unknown acid	12.61	4.4
2	Unknown	13.55	7.7
3			.
4			
5			
6			
7			
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9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water
WA # 0-107 Jard Co. Site

Sample #	C-D27609	LabFile#	JAR005 <th>Con. Factor</th> <td>1.0</td> <th data-kind="parent" data-rs="2">Conc.* µg/L</th>	Con. Factor	1.0	Conc.* µg/L
	CAS#	Compound		Q	RT	
1		Unknown acid			13.55	6.9
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
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19						
20						

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water

WA # 0-107 Jard Co. Site

Sample #	C-D27610	Con. Factor	1.0
LabFile#	JAR006		
		Conc.*	
		µg/L	
1	Unknown acid	13.55	9.6
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water

WA # 0-107 Jard Co. Site

Sample #	C-D27611	Con. Factor	1.0		
LabFile#	JAR007		Conc.*		
	CAS#	Compound	Q	RT	Conc.*
1		Unknown acid		12.61	7.7
2		Unknown acid		13.55	15
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water
WA # 0-107 Jard Co. Site

Sample #	C-D27614	Con. Factor	1.0
LabFile#	JAR010	Conc.*	µg/L
1	No TICs were detected	Q	RT
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water

WA # 0-107 Jard Co. Site

Sample #	C-D27615	Con. Factor	1.0
LabFile#	JAR011	Conc.*	
	Compound	Q	RT
	CAS#		µg/L
1	Unknown acid	13.55	6.7
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water

WA # 0-107 Jard Co. Site

Sample #	C-D27616	LabFile#	JAR012	Con. Factor	1.0	Conc.*
	CAS#	Compound		Q	RT	µg/L
1		Unknown acid			13.55	4.5
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
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19						
20						

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water

WA # 0-107 Jard Co. Site

Sample #	C-D27617	Con. Factor	1.0		
LabFile#	JAR015	Conc.*			
	CAS#	Compound	Q	RT	Conc.*
1		Unknown acid		13.55	8.8
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water

WA # 0-107 Jard Co. Site

Sample #	C-D27618	Con. Factor	1.0
LabFile#	JAR013	Conc.*	μg/L
1	000105-60-2	Caprolactam	35
2		Unknown acid	5.7
3		Unknown acid	10
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water

WA # 0-107 Jard Co. Site

Sample #	C-D27619	Con. Factor	1.0		
LabFile#	JAR016	Conc.*			
	CAS#	Compound	Q	RT	Conc.*
1	000105-60-2	Caprolactam	91	7.46	9.2
2		Dimethyl-phenylmethyl-benzene isomer		9.98	21
3		Dichloro-biphenyl isomer		10.02	18
4		Unknown acid		13.55	4
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water
WA # 0-107 Jard Co. Site

Sample #	C-D27620	Con. Factor	5.0		
LabFile#	JAR017	Conc.*	Conc.*		
	CAS#	Compound	Q	RT	µg/L
1		Unknown PAH isomer		8.57	660
2		Dimethyl-phenylimethyl-benzene isomer + dichloro-biphenyl isomer		10.04	1900
3		Dimethyl-phenylimethyl-benzene isomer		10.24	2000
4		Dichloro-biphenyl isomer		10.44	430
5		Dichloro-biphenyl isomer		10.53	1600
6		Trichloro-biphenyl isomer		10.76	370
7		Trichloro-biphenyl isomer		10.99	990
8		Trichloro-biphenyl isomer		11.20	820
9		Trichloro-biphenyl isomer		11.36	290
10		Trichloro-biphenyl isomer		11.49	1400
11		Trichloro-biphenyl isomer		11.61	880
12		Trichloro-biphenyl isomer		11.69	490
13		Tetrachloro-biphenyl isomer		11.83	530
14		Tetrachloro-biphenyl isomer		11.88	430
15		Tetrachloro-biphenyl isomer		11.93	470
16		Tetrachloro-biphenyl isomer		12.06	420
17		Trichloro-biphenyl isomer		12.12	510
18		Tetrachloro-biphenyl isomer		12.20	600
19		Tetrachloro-biphenyl isomer		12.44	270
20		Tetrachloro-biphenyl isomer		12.49	300

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water

WA # 0-107 Jard Co. Site

Sample #	C-D27621	Con. Factor	1.0
LabFile#	JAR025	Conc.*	
	Compound	Q	RT
			µg/L
1	Unknown acid	13.55	5.0
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water

WA # 0-107 Jard Co. Site

Sample # C-D27624

LabFile# JAR021

Con. Factor

1.0

	CAS#	Compound	Q	RT	Conc.* µg/L
1		Unknown acid		13.55	6.5
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water
WA # 0-107 Jard Co. Site

Sample #	C-D27625	LabFile#	JAR022	Con. Factor	1.0	Conc.* µg/L
				Q	RT	
1		No TICs were detected				
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

* Estimated Concentration (Response Factor = 1)

**Table 1.4 (cont.) Results of TIC for BNA in Water
WA # 0-107 Jard Co. Site**

Sample #	C-D27626	LabFile#	JAR023	Con. Factor	1.0
	CAS#	Compound	Q	RT	Conc.* µg/L
1		Unknown acid		12.61	6.1
2		Unknown acid		13.55	8.8
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

* Estimated Concentration (Response Factor = 1)

Table 1.4 (cont.) Results of TIC for BNA in Water
WA # 0-107 Jard Co. Site

Sample #

C-D27627

LabFile#

JAR024

Con. Factor

1.0

	CAS#	Compound	Q	RT	Conc.*
1		No TICs were detected			
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

* Estimated Concentration (Response Factor = 1)

Table 1.5 Results of the Analysis for PCB in Water
WA# 0-107, Jard Co. Site

Client ID Location	WBLK020700		AB27607 MW-2		AB27608 EPA-3		AB27609 EPA-4		AB27610 EPA-4 DUP	
	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L
Analyte										
Aroclor 1016	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
Aroclor 1221	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50
Aroclor 1232	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
Aroclor 1242	U	0.25	U	0.25	U	0.25	8.5	W	0.25	6.3
Aroclor 1248	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
Aroclor 1254	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
Aroclor 1260	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
Aroclor 1268	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25

Table 1.5 (cont.) Results of the Analysis for PCB in Water
WA# 0-107, Jard Co. Site

Client ID Location	AB27611 EPA-5		AB27614 EPA-6		AB27615 EPA-7		AB27616 EPA-8		AB27618 MW-1	
	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L	Conc. µg/L	MDL µg/L
Aroclor 1016	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
Aroclor 1221	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50
Aroclor 1232	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
Aroclor 1242	U	0.25	U	0.25	U	0.25	U	0.25	2.4 W	0.25
Aroclor 1248	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
Aroclor 1254	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
Aroclor 1260	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
Aroclor 1268	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25

Table 1.5 (cont.) Results of the Analysis for PCB in Water
WA# 0-107, Jard Co. Site

Client ID Location	AB27617 MW-4		AB27619 MW-6		AB27620 EPA-1		AB27621 EPA-2		AB27624 EPA-9		
	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L	
Analyte											
Aroclor 1016	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
Aroclor 1221	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	
Aroclor 1232	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
Aroclor 1242	U	0.25	19	W	0.25	5200	W	0.25	4.5	W	0.25
Aroclor 1248	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
Aroclor 1254	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
Aroclor 1260	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
Aroclor 1268	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	

Table 1.5 (cont.) Results of the Analysis for PCB in Water
WA# 0-107, Jard Co. Site

Client ID Location	AB27625 EPA-10		AB27626 EPA-10 DUP		AB27627 Bailer Blank	
	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L
Aroclor 1016	U	0.25	U	0.25	U	0.25
Aroclor 1221	U	0.50	U	0.50	U	0.50
Aroclor 1232	U	0.25	U	0.25	U	0.25
Aroclor 1242	7.0	W 0.25	6.1 W	0.25	U	0.25
Aroclor 1248	U	0.25	U	0.25	U	0.25
Aroclor 1254	U	0.25	U	0.25	U	0.25
Aroclor 1260	U	0.25	U	0.25	U	0.25
Aroclor 1268	U	0.25	U	0.25	U	0.25

Table 1.5 (cont.) Results of the Analysis for PCB in Water
WA# 0-107, Jard Co. Site

Client ID Location	WBLK021700		A-C 27629 EPA-1	
	Conc. μg/L	MDL μg/L	Conc. μg/L	MDL μg/L
Aroclor 1016	U	0.25	U	2.5
Aroclor 1221	U	0.50	U	5.0
Aroclor 1232	U	0.25	U	2.5
Aroclor 1242	U	0.25	21000 W	2.5
Aroclor 1248	U	0.25	U	2.5
Aroclor 1254	U	0.25	U	2.5
Aroclor 1260	U	0.25	U	2.5
Aroclor 1268	U	0.25	U	2.5

QA/QC for VOC

Results of the Internal Standard Areas and Surrogate Percent Recoveries for VOC in Water

Each sample was spiked with a three component mixture of CLP surrogate standards consisting of toluene-d₈, 4-bromofluorobenzene and 1,2-dichloroethane-d₄. The surrogate percent recoveries, listed in Table 2.1, ranged from 86 to 107. All 72 values were within the acceptable QC limits. The internal standard areas (for bromochloromethane, 1,4-difluorobenzene, and chlorobenzene-d₅) are also listed in Table 2.1. All 72 areas are within the acceptable QC limits.

Results of the Matrix Spike/Matrix Spike Duplicate Analysis for VOC in Water

Samples E-G27607 and E-G27621 were chosen for the MS/MSD analyses for the water samples. The percent recoveries, ranging from 95 to 114, are listed in Table 2.2. All 20 values were within the acceptable QC limits. The relative percent differences, also listed in Table 2.2, ranged from zero (0) to 4, and all 10 values were within the acceptable QC limits.

**Table 2.1 Results of the Internal Standard Areas & Surrogate Percent Recoveries for VOC in Water
WA# 0-107, Jard Co. Site**

Analysis Date 020400
Matrix Water

File ID	Sample No.	IS 1	IS 2	IS 3	Sur. 1	Sur. 2	Sur. 3
AV1404.D	Water blank 020400-2	209826	1847190	1030800	102	103	87
AV1405.D	E-G27627	206540	1770525	984973	102	104	88
AV1406.D	A-D27628	201278	1783821	996406	105	104	86
AV1407.D	E-G27607	197844	1729682	971583	105	104	87
AV1408.D	E-G27608	196930	1771863	997430	106	104	86
AV1409.D	E-G27609	196360	1757072	986887	106	104	86
AV1410.D	E-G27610	197929	1749647	989402	106	104	86
AV1411.D	E-G27611	193592	1720907	969678	107	104	87
AV1412.D	E-G27614	196926	1733154	981959	107	104	87
AV1413.D	E-G27615	195944	1737615	982239	107	104	87

Cal Check Area AV1403.D 219575 1855250 1114250

Surrogate Limits					
				Water	Soil
IS 1	Bromochloromethane	Surr. 1	1,2-Dichloroethane-d4	76 - 114	70-121
IS 2	1,4-Difluorobenzene	Surr. 2	Toluene-d8	88 - 110	84-138
IS 3	Chlorobenzene-d5	Surr. 3	p-Bromofluorobenzene	86 - 115	59-113

**Table 2.1 (cont.) Results of the Internal Standard Areas & Surrogate Percent Recoveries for VOC in Water
WA# 0-107, Jard Co. Site**

Analysis Date 020900
Matrix Water

File ID	Sample No.	IS 1	IS 2	IS 3	Surr. 1	Surr. 2	Surr. 3
BV1061.D	Water blank 020900	176050	1690219	1155725	100	101	99
BV1062.D	E-G27616	172844	1652238	1134133	101	101	99
BV1063.D	E-G27618	168585	1619484	1111929	101	101	99
BV1064.D	E-G27617	171823	1647558	1135559	101	101	98
BV1065.D	E-G27619	172183	1644023	1136627	101	101	98
BV1066.D	E-G27621	168827	1628638	1128655	103	101	98
BV1067.D	E-G27624	167273	1614300	1119257	102	101	98
BV1068.D	E-G27625	167801	1626764	1130937	103	101	98
BV1069.D	E-G27626	168975	1624289	1131987	101	101	98
BV1070.D	E-G27607 ms	167794	1623483	1126128	103	100	97
BV1071.D	E-G27607 msd	169266	1632036	1139172	103	100	98
BV1074.D	E-G27621 ms	172654	1660940	1147138	103	100	98
BV1075.D	E-G27621 msd	169587	1635350	1133642	101	100	98
BV1076.D	E-G27620	165884	1630188	1127920	103	101	99

Cal Check Area BV1060.D 183739 1703090 1179800

Surrogate Limits			
IS 1	Bromochloromethane	Sur. 1	1,2-Dichloroethane-d4
IS 2	1,4-Difluorobenzene	Sur. 2	Toluene-d8
IS 3	Chlorobenzene-d5	Sur. 3	p-Bromofluorobenzene

**Table 2.2 Results of MS/MSD Analysis for VOC in Water
WA# 0-107, Jard Co. Site**

Sample ID: E-G27607

Compound Name	MS		MSD					QC Limits	
	Sample Conc. ($\mu\text{g/L}$)	Spike Added ($\mu\text{g/L}$)	Spike Added ($\mu\text{g/L}$)	MS Conc. ($\mu\text{g/L}$)	MSD Conc. ($\mu\text{g/L}$)	MS % Rec.	MSD % Rec.		
	RPD	% Rec.							
1,1-Dichloroethene	U	50.0	50.0	56.6	56.8	113	114	0	14 61 - 145
Benzene	U	50.0	50.0	51.7	51.8	103	104	0	11 76 - 127
Trichloroethene	U	50.0	50.0	50.1	50.4	100	101	1	14 71 - 120
Toluene	U	50.0	50.0	51.2	51.1	102	102	0	13 76 - 125
Chlorobenzene	U	50.0	50.0	50.2	50.2	100	100	0	13 75 - 130

00048

**Table 2.2 (cont.) Results of MS/MSD Analysis for VOC in Water
WA# 0-107, Jard Co. Site**

Sample ID: E-G27621

Compound Name	MS	MSD						QC Limits			
	Sample	Spike	Spike	MS	MSD	MS	MSD				
	Conc.	Added	Added	Conc.	Conc.	%	%	RPD	% Rec.		
(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	(μg/L)	Rec.	Rec.	RPD	% Rec.		
1,1-Dichloroethene	U	50.0	50.0	52.4	54.7	105	109	4	14	61 -	145
Benzene	U	50.0	50.0	49.0	49.4	98	99	1	11	76 -	127
Trichloroethylene	U	50.0	50.0	47.5	47.8	95	96	1	14	71 -	120
Toluene	U	50.0	50.0	48.3	49.1	97	98	2	13	76 -	125
Chlorobenzene	U	50.0	50.0	47.7	48.3	95	97	1	13	75 -	130

QA/QC for BNA

Results of the Surrogate Percent Recoveries for BNA in Water

Before extraction, each sample was spiked with a six component mixture of CLP surrogate standards consisting of nitrobenzene-d₅, 2-fluorobiphenyl, terphenyl-d₁₄, phenol-d₅, 2-fluorophenol, and 2,4,6-tribromophenol. The reported surrogate percent recoveries, listed in Table 2.3, ranged from zero (0) to 85. One hundred-thirty-six out of 138 reported values were within the acceptable QC limits. Six surrogates were diluted out and their percent recoveries were not reported.

Results of the Internal Standard Areas for BNA in Water

The internal standard areas (for 1,4-dichlorobenzene-d₄, naphthalene-d₈, acenaphthene-d₁₀, phenanthrene-d₁₀, chrysene-d₁₂, perylene-d₁₂) are listed in Table 2.4. One hundred-thirty-seven out of 138 values were within the acceptable QC limits.

Results of the Matrix Spike/Matrix Spike Duplicate Analysis for BNA in Water

Samples C-D27612 and C-D27613, both from location EPA-5, (sample C-D27611, location EPA-5, results were subtracted from these MS/MSD sample results), and samples C-D27622 and C-D27623, both from location EPA-2 (sample C-D27621, location EPA-2, results were subtracted from these MS/MSD sample results) were chosen for the matrix spike/matrix spike (MS/MSD) duplicate analysis. The percent recoveries, ranging from 26 to 87, are listed in Table 2.5. All 44 values were within the acceptable QC limits. The relative percent differences, ranging from zero (0) to 19, are also listed in Table 2.5. All 22 values were within the acceptable QC limits.

Table 2.3 Results of the Surrogate Percent Recoveries for BNA in Water
WA # 0-107 Jard Co. Site

Analysis Date 02/10/00
 Matrix Water

Sample No.	File ID	Surr. 1	Surr. 2	Surr. 3	Surr. 4	Surr. 5	Surr. 6
SBLK020800	JAR002.D	44	29	76	75	65	77
C-D27607 W029	JAR003.D	43	30	73	69	66	74
C-D27608 W032	JAR004.D	41	28	74	70	61	75
C-D27609 W035	JAR005.D	48	32	81	76	69	76
C-D27610 W038	JAR006.D	51	35	76	72	71	76
C-D27611 W041	JAR007.D	40	28	67	62	60	72
C-D27612 W044	JAR008.D	53	39	83	81	78	78
C-D27613 W046	JAR009.D	51	36	83	79	79	80
C-D27614 W048	JAR010.D	40	28	77	75	52	76
C-D27615 W051	JAR011.D	45	33	85	81	70	78
C-D27616 W054	JAR012.D	39	27	79	73	62	75
C-D27617 W057	JAR013.D	31	24	69	65	34	70

Surrogate Limits

	Water
Surr 1 2-Fluorophenol	(21-110)
Surr 2 Phenol-d5	(10-110)
Surr 3 Nitrobenzene-d5	(35-114)
Surr 4 2-Fluorobiphenyl	(43-116)
Surr 5 2,4,6-Tribromophenol	(10-123)
Surr 6 Terphenyl-d14	(33-141)

Table 2.3 (cont.) Results of the Surrogate Percent Recoveries for BNA in Water
WA # 0-107 Jard Co. Site

Analysis Date 02/12/00
 Matrix Water

Sample No.	File ID	Surr. 1	Surr. 2	Surr. 3	Surr. 4	Surr. 5	Surr. 6
C-D27617 W060	JAR015.D	44	31	74	68	58	72
C-D27619 W063	JAR016.D	45	31	78	76	65	71
C-D27620 W066	JAR017.D	30	37	74	78	0 *	0
C-D27621 W069	JAR018.D	34	32	77	71	33	74
C-D27622 W072	JAR019.D	40	34	78	74	71	73
C-D27623 W074	JAR020.D	40	34	82	78	70	76
C-D27624 W076	JAR021.D	40	35	85	80	61	81
C-D27625 W079	JAR022.D	41	35	84	79	68	79
C-D27626 W082	JAR023.D	41	35	83	76	67	77
C-D27627 W085	JAR024.D	41	34	82	78	72	77
C-D27621 W069	JAR025.D	33	29	80	72	31	72
C-D27620 W066 5000x	JAR026.D	D	D	D	D	D	D

Surrogate Limits

Water

Surr 1	2-Fluorophenol	(21-110)
Surr 2	Phenol-d5	(10-110)
Surr 3	Nitrobenzene-d5	(35-114)
Surr 4	2-Fluorobiphenyl	(43-116)
Surr 5	2,4,6-Tribromophenol	(10-123)
Surr 6	Terphenyl-d14	(33-141)

Table 2.4 Results of the Internal Standard Areas for BNA in Water
WA # 0-107 Jard Co. Site

Analysis Date 02/10/00
 Matrix Water

Sample No.	File ID	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6
SBLK020800	JAR002.D	65546	236231	117991	202784	177388	153239
C-D27607 W029	JAR003.D	62968	224007	116034	201205	181755	159177
C-D27608 W032	JAR004.D	58729	213992	111396	192762	180560	159535
C-D27609 W035	JAR005.D	59782	219153	114126	199277	187942	161920
C-D27610 W038	JAR006.D	61625	224819	116328	201736	182885	155156
C-D27611 W041	JAR007.D	58892	210439	108854	193019	183341	157104
C-D27612 W044	JAR008.D	61358	223075	114004	199267	183501	156864
C-D27613 W046	JAR009.D	58084	212348	109930	190545	176674	150205
C-D27614 W048	JAR010.D	58023	209057	107808	193734	183833	156206
C-D27615 W051	JAR011.D	57329	204657	109080	195820	180866	154943
C-D27616 W054	JAR012.D	54518	197344	104515	190976	181385	155576
C-D27617 W057	JAR013.D	57192	211185	111318	197084	180693	151422

Cal Check Area	JAR001.D	84717	321106	157228	236509	194650	202907
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IS 1 = d4-Dichlorobenzene
 IS 2 = d8-Naphthalene
 IS 3 = d10-Acenaphthene
 IS 4 = d10-Phenanthrene
 IS 5 = d12-Chrysene
 IS 6 = d12-Perylene

Table 2.4 (cont.) Results of the Internal Standard Areas for BNA in Water
WA # 0-107 Jard Co. Site

Analysis Date 02/12/00
 Matrix Water

Sample No.	File ID	IS 1	IS 2	IS 3	IS 4	IS 5	IS 6
C-D27617 W060	JAR015.D	59051	216803	114727	204907	183821	155600
C-D27619 W063	JAR016.D	54933	198488	104523	186532	177772	154152
C-D27620 W066	JAR017.D	57620	214204	116909	280172	34691*	190530
C-D27622 W072	JAR019.D	68384	246841	128498	224876	208639	187257
C-D27623 W074	JAR020.D	62538	226278	121176	214826	195520	171555
C-D27624 W076	JAR021.D	62303	225704	121213	209816	184218	161021
C-D27625 W079	JAR022.D	58465	205810	111419	196485	172834	148130
C-D27626 W082	JAR023.D	57654	210242	113460	201117	174451	145440
C-D27627 W085	JAR024.D	56367	198932	108222	190908	165807	138829
C-D27621 W069	JAR025.D	52864	193893	105484	190009	166327	137782
C-D27620 W066 5000x	JAR026.D	50308	173102	94308	172347	153350	123383
Cal Check Area	JAR014.D	75557	283469	147053	228327	191165	195652

IS 1 = d4-Dichlorobenzene
 IS 2 = d8-Naphthalene
 IS 3 = d10-Acenaphthene
 IS 4 = d10-Phenanthrene
 IS 5 = d12-Chrysene
 IS 6 = d12-Perylene

Table 2.5 Results of MS/MSD Analysis for BNA in Water
WA # 0-107 Jard Co. Site

Sample ID: C-D27611
 Location: EPA-5

Compound Name	MS				MSD				QC Limits		
	Sample	Spike	MS	MS	Spike	MSD	MSD	%	RPD	% Rec.	RPD
	Conc.	Added	Conc.	%	Added	Conc.	Conc.	%			
μg/L	μg/L	μg/L	Rec.		μg/L	μg/L	Rec.				
Phenol	U	100	38	38	100	37.4	37	2	12 -	110	42
2-Chlorophenol	U	100	71.6	72	100	71.5	72	0	27 -	123	40
1,4-Dichlorobenzene	U	50	33	66	50	34.7	69	5	36 -	97	28
N-Nitroso-Di-N-Propylamine	U	50	40.4	81	50	42.6	85	5	41 -	116	38
1,2,4-Trichlorobenzene	U	50	37.7	75	50	38.8	78	3	39 -	98	28
4-Chloro-3-Methylphenol	U	100	77.9	78	100	82.2	82	5	23 -	97	42
Acenaphthene	U	50	41.9	84	50	43.3	87	3	46 -	118	31
4-Nitrophenol	U	100	40	40	100	36.8	37	8	10 -	80	50
2,4-Dinitrotoluene	U	50	40.3	81	50	41.6	83	3	24 -	96	38
Pentachlorophenol	U	100	62.6	63	100	55.4	55	12	9 -	103	50
Pyrene	U	50	40.7	81	50	42.4	85	4	26 -	127	31

Table 2.5 (cont.) Results of MS/MSD Analysis for BNA in Water
WA # 0-107 Jard Co. Site

Sample ID:	C-D27621									
Location:	EPA-2									
Compound Name	MS		MSD		QC Limits					
	Sample Conc.	Spike Added	MS Conc.	MS %	Spike Added	MSD Conc.	MSD %	RPD	% Rec.	RPD
	µg/L	µg/L	µg/L	Rec.	µg/L	µg/L	Rec.			
Phenol	U	100	32.7	33	100	33	33	1	12 - 110	42
2-Chlorophenol	U	100	69.1	69	100	70.7	71	2	27 - 123	40
1,4-Dichlorobenzene	U	50	32.3	65	50	32.6	65	1	36 - 97	28
N-Nitroso-Di-N-Propylamine	U	50	41	82	50	43.2	86	5	41 - 116	38
1,2,4-Trichlorobenzene	U	50	34.5	69	50	36.5	73	6	39 - 98	28
4-Chloro-3-Methylphenol	U	100	73.7	74	100	76.6	77	4	23 - 97	42
Acenaphthene	U	50	41	82	50	42.2	84	3	46 - 118	31
4-Nitrophenol	U	100	36.4	36	100	35.8	36	2	10 - 80	50
2,4-Dinitrotoluene	U	50	39.4	79	50	41.8	84	6	24 - 96	38
Pentachlorophenol	U	100	25.7	26	100	31.2	31	19	9 - 103	50
Pyrene	U	50	39.3	79	50	39.8	80	1	26 - 127	31

Results of the Surrogate Percent Recoveries for PCB in Water

Percent recoveries for the water samples ranged from 41 to 116 and are listed in Table 2.6. Thirty-nine out of 48 values were within the acceptable QC limits.

Results of the MS/MSD Analysis for PCB in Water

Samples A-B27612 and A-B27613; both from location EPA-5, (sample A-B27611, location EPA-5, results were subtracted from these MS/MSD sample results), and samples A-B27622 and A-B27623, both from location EPA-2 (sample A-B27621, location EPA-2, results were subtracted from these MS/MSD sample results) were chosen for the matrix spike/matrix spike (MS/MSD) duplicate analysis. The percent recoveries ranged from 68 to 108 and are listed in Table 2.7. The relative percent differences (RPDs), also listed in Table 2.7, were 7 and 34. No QC limits are available for these analyses.

**Table 2.6 Results of the Surrogate Percent Recoveries
for PCB in Water
WA# 0-107, Jard Co. Site**

Sample ID	Percent Recovery TCMX	Percent Recovery DCBP
WBLK020700	53 *	112
A-B27607	68	116
A-B27608	58 *	100
A-B27609	64	103
A-B27610	65	105
A-B27611	67	108
A-B27612MS	57 *	95
A-B27613MSD	62	104
A-B27614	71	97
A-B27615	68	102
A-B27616	60	111
A-B27618	64	109
A-B27617	55 *	91
A-B27619	54 *	78
A-B27620	50 *	41 *
A-B27621	61	81
A-B27622MS	47 *	82
A-B27623MSD	61	73
A-B27624	63	78
A-B27625	82	93
A-B27626	68	92
A-B27627	75	97

	ADVISORY QC Limits
Tetrachloro-m-xylene (TCMX)	60-150
Decachlorobiphenyl (DCBP)	60-150

**Table 2.6 (cont.) Results of the Surrogate Percent Recoveries
for PCB in Water
WA# 0-107, Jard Co. Site**

Sample ID	Percent Recovery TCMX	Percent Recovery DCBP
WBLK021700	96	86
A-C 27629	64	53 *

	ADVISORY QC Limits
Tetrachloro-m-xylene (TCMX)	60-150
Decachlorobiphenyl (DCBP)	60-150

**Table 2.7 Results of the MS/MSD Analysis for PCB in Water
WA# 0-107, Jard Co. Site**

Sample ID: A-B27611
Location: EPA-5

Compound	Sample Conc µg/L	MS Spike Added µg/L	MS Conc µg/L	MS % Rec	MSD Spike Added µg/L	MSD Conc µg/L	MSD % Rec	RPD
AR 1242	U	1.000	0.676	68	1.000	0.729	73	7

Sample ID: A-B27621
Location: EPA-2

Compound	Sample Conc µg/L	MS Spike Added µg/L	MS Conc µg/L	MS % Rec	MSD Spike Added µg/L	MSD Conc µg/L	MSD % Rec	RPD
AR 1242	4.467	1.000	5.233	77	1.000	5.550	108	34

REAC, Edison, NJ

732-908-321-4200

EPA Contract 68-C4-0022

(68-C99-223)

CHAIN OF CUSTODY RECORDProject Name: Jard CompanyProject Number: EPA 00107LM-RCW Contact: Don Bussey Phone: 732-841-491-4056No: 03477SHEET NO. 1 OF 2

020400-

Sample IdentificationAnalyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCB	Semi. VOC	VOC	MS
028	A-B27607	MW-2	W	2/2/00	2	1 liter Amber/4°C	X			
029	C-D27607	MW-2	W		2	1 liter clear/4°C		X		
030	E-G27607	MW-2			3	4ml/4°C			X	
031	A-B27608	EPA-3			2	1l Amber/4°C	X			
032	C-D27608				2	1l clear/4°C		X		
033	E-G27608	↓			3	4ml/4°C		X		
034	A-B27609	EPA-4			2	1l Amber/4°C	X		X	
035	C-D27609	↓			2	1l Clear/4°C		X		
036	E-G27609	↓			3	4ml/4°C		X		
037	A-B27610	EPA-4 Dup			2	1l Amber/4°C	X			
038	C-D27610	EPA-4 Dup			2	1l Clear/4°C		X		
039	E-G27610	EPA-4 Dup			3	4ml/4°C		X		
040	A-B27611	EPA-5			2+4	1l Amber/4°C	X			X
041	C-D27611	↓			2+4	1l clear/4°C		X		X
042	E-G27611	↓			3	1l 4ml/4°C			X	
043	A-B27612	EPA-5 MS			2	1l Amber/4°C			X	
044	C-D27612	↓			2	1l clear/4°C			X	
045	A-B27618	EPA-5 MSD			2	1l Amber/4°C				
046	C-D27613	↓			2	1l clear/4°C				X

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

NOTE:

Chain corresponds to

Coolers 1, 2, 3

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF
CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All Analysis	John Bussey	2/3/00	Don Bussey	2/10/00	1430	Acceptance	John Bussey	2/10/00	Acceptance	2/10/00	1430
						Specimen	John Bussey	2/10/00	Specimen	2/10/00	1430

REAC, Edison, NJ
1908) 321-4200

EPA Contract 68-C4-0022

(68-C99-223)

CHAIN OF CUSTODY RECORD

Project Name: Third Company Site.

Project Number: R1A00107

LM/BEN Contact: Dan Baussey Phone: 732-494-4050

No: 03479

SHEET NO. 1 OF 2

U20400

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCB	Semi揮发	TOX	MS
C56	A-B27618	MW-1	N	2/3/00	2	1L Amber /4°C	X			
C57	C-D 27618	↓			2	1L Clear /4°C		X		
C58	E-G 27618	↓			3	4mL /4°C			X	
C59	A-B 27617	MW-4			2	1L Amber /4°C	X			
C60	C-D 27617	↓			2	1L Clear /4°C		X		
C61	E-G 27617	↓			3	4mL /4°C			X	
C62	A-B 27619	MW-10			2	1L Amber /4°C	X			
C63	C-D 27619	↓			2	1L Clear /4°C		X		
C64	E-G 27619	↓			3	4mL /4°C		X		
C65	A-B 27620	EPA-1			2	1L Amber /4°C	X			
C66	C-D 27620	↓			2	1L Clear /4°C		X		
C67	E-G 27620	↓			3	4mL /4°C			X	
C68	A-B 27621	EPA-2			2+4	1L Amber /4°C	X			X
C69	C-D 27621	↓			2+4	1L Clear /4°C		X		X
C70	E-G 27621	↓			3	4mL /4°C			X	
C71	A-B 27622	EPA-2 MS			2	1L Amber /4°C				X
C72	C-D 27622	↓			2	1L Clear /4°C				X
C73	A-B 27623	EPA-2 MS			2	1L Amber /4°C				
C74	C-D 27623	↓			2	1L Clear /4°C				X

Matrix:

SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other

PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge

S - Soil
W - Water
O - Oil
A - Air

(Special Instructions:

Sample A-G 27620 are contaminated

NOTE: Chain of Custody Corresponds to
Circles 0, 4, 5, 6

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF
CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All Analyses	Releasor	2/3/00	Releasor	2/4/00	12:30	All Analyses	Releasor	2/4/00	Releasor	2/4/00	4:00 PM
						Signatory	Releasor	2/4/00	Releasor	2/4/00	4:00 PM

FORM #4

FIRS Reference #44

REAC, Edison, NJ

(908) 321-4200

EPA Contract 68-C4-0022

68-199-223

CHARTER OF CUSTODY RECORD

Project Name: Jard Company S.L.

Project Number: RJTA00187

Project Name:
PRW Contact: Don Bussey

Lm REW Contact: Don Bussey Phone: 732-494-1050

No: 03481

SHEET NO. 2 OF 2

75 of 76

Sample Identification

Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PCB	Semi VOCs	IOC
075	A-B 27624	EPA-9	W	2/3/00	2	1L Amber /4°C	X		
076	C-D 27624	↓			2	1L Clear /4°C		X	
077	E-G 27624	↓			3	4mL /4°C			X
078	A-B 27625	EPA-10			2	1L Amber /4°C	X		
079	C-D 27625	↓			2	↓		X	
080	E-G 27625	↓			3	4mL /4°C			X
081	A-B 27626	EPA-10 Dup			2	1L Amber /4°C	X		
082	C-D 27626	↓			2	↓		X	
083	E-G 27626	↓			3	4mL /4°C			X
084	A-B 27627	Boiler Blank			2	1L Amber /4°C	X		
085	C-D 27627	↓			2	↓		X	
086	E-G 27627	↓			3	4mL /4°C		X	
087	A-B 27628	Trip Blank			4	4mL /4°C		X	

Matrix:

**SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other**

PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge

S - Soil
W - Water
O - Oil
A - Air

Special Instructions:

Note:

Chain of Custody Corresponds to
Custodians 4, 5, 6

FOR SUBCONTRACTING USE ONLY

**FROM CHAIN OF
CUSTODY #**

REAC, Edison, NJ

132 (908) 321-4200

EPA Contract 68-C4-0022 DA
68-C44-223

CHAIN OF CUSTODY RECORD

Project Name: JARD COMPANY SITE
Project Number: RIA00107
RFW Contact: Don Lusk Phone: (732) 444-4056

No: 03428

SHEET NO. 1 OF 1

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Sample Identification

Analyses Requested

Matrixx

SD - Sediment
DS - Drum Solids
DL - Drum Liquids
X - Other

PW - Potable Water
GW - Groundwater
SW - Surface Water
SL - Sludge

S - Soil
W - Water
O - Oil
A - Air

Special Instructions:

NO NO / Nsp Necess.

FOR SUBCONTRACTING USE ONLY

**FROM CHAIN OF
CUSTODY #**